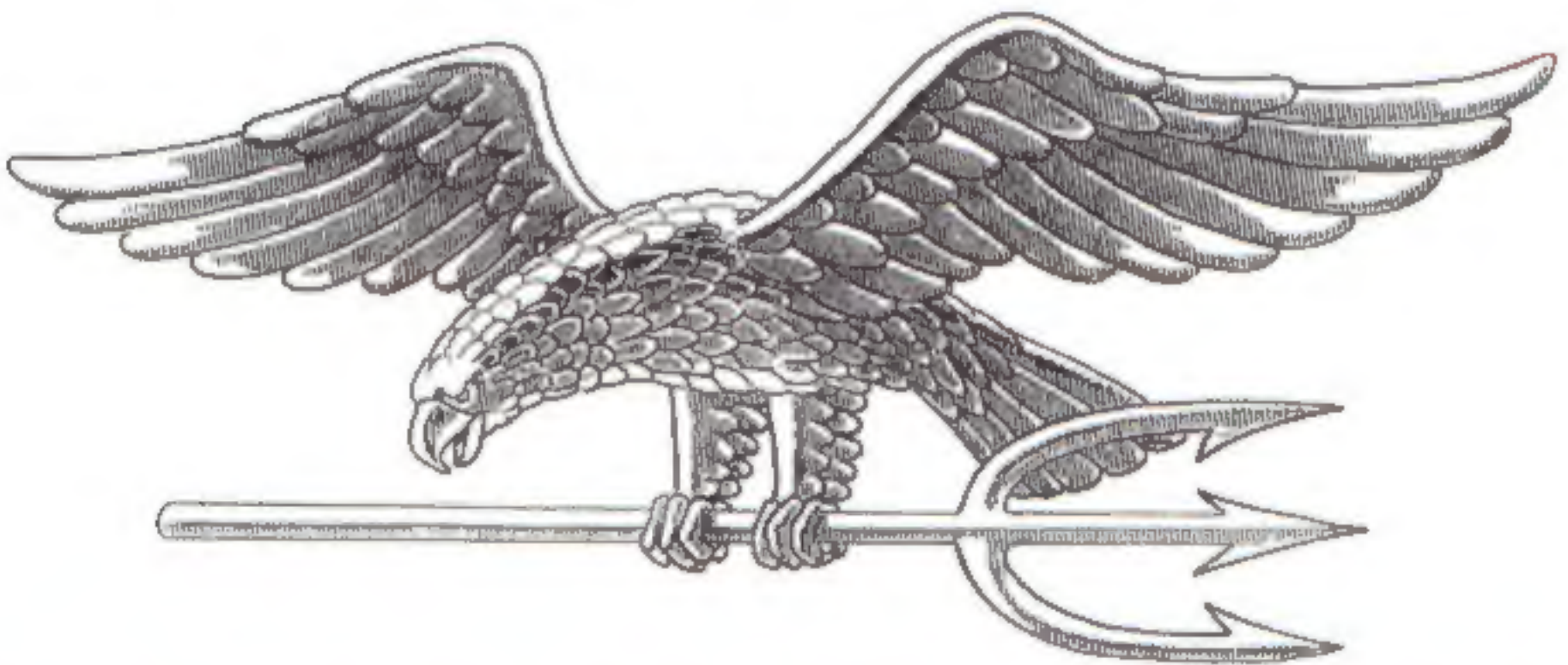


SCIENTIFIC PRINCIPLES OF IMPROVISED WARFARE AND HOME DEFENSE Volume 2

The Basics

- Bio Toxic Weapons
- Defensive Obstacle Construction and Countermeasures
 - Armor Personal Protection and Material Handling
 - Booby Traps Mines and Positioned Weapons
 - Combat Support Skills and Equipment
- Strategies Tactics Resistance and Countermeasures



Scientists right to bear arms: I will give up my right to know how to construct a long metal tube, enclosed on one end, and capable of propelling projectiles at high velocity, when they pry the know-how from my cold dead brain!

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1996 BY TIMOTHY W TOBIASON

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**Scientific Principles of Improvised
Warfare and Home Defense**

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Scientific Principles of Improvised Warfare and Home Defense

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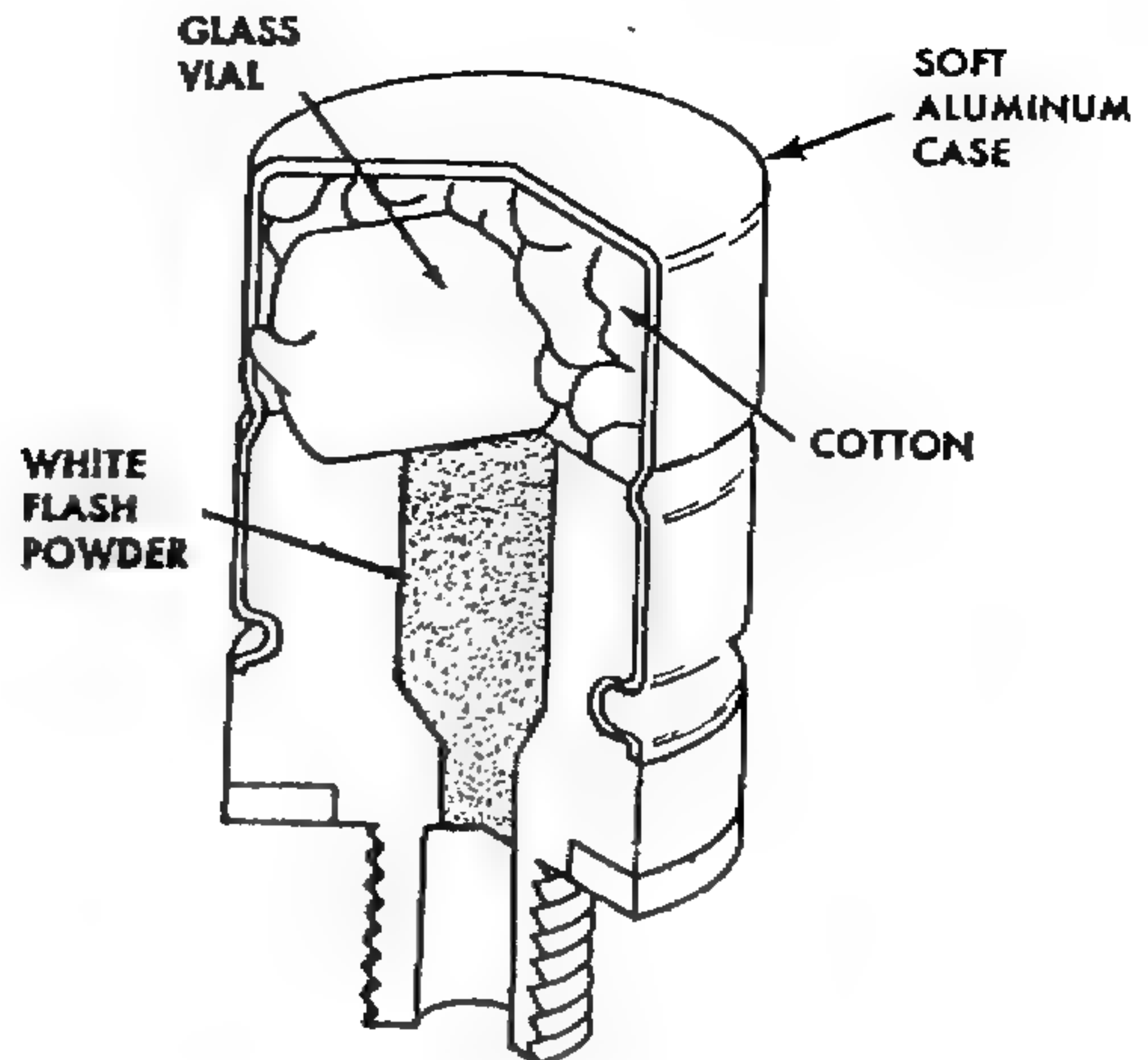
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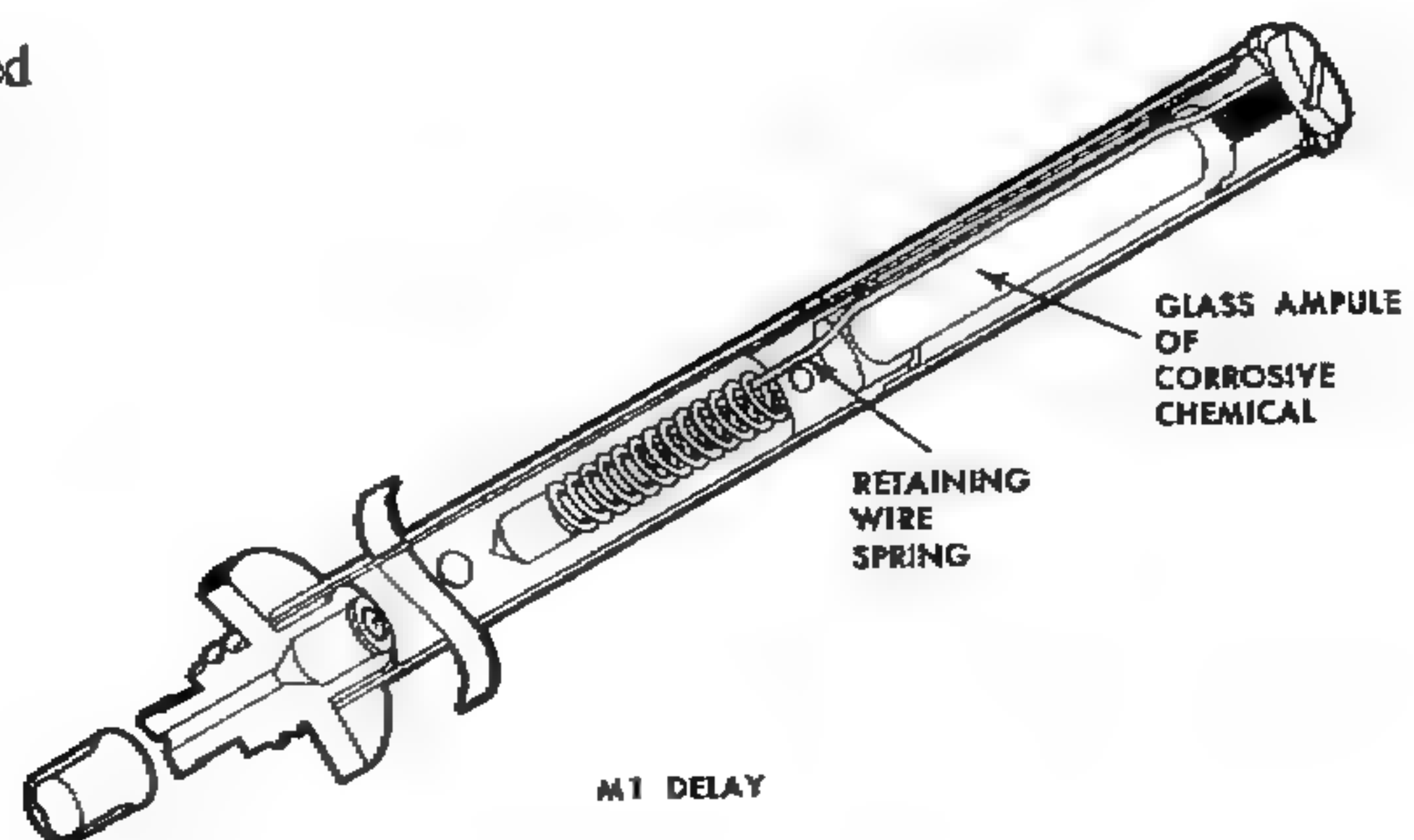
Chemicals are used for longer delay devices.

A quick detonation can be produced using sulfuric acid in a glass vial. When the pressure is applied, the acid mixes with the powder and causes a flame that ignites the charge.



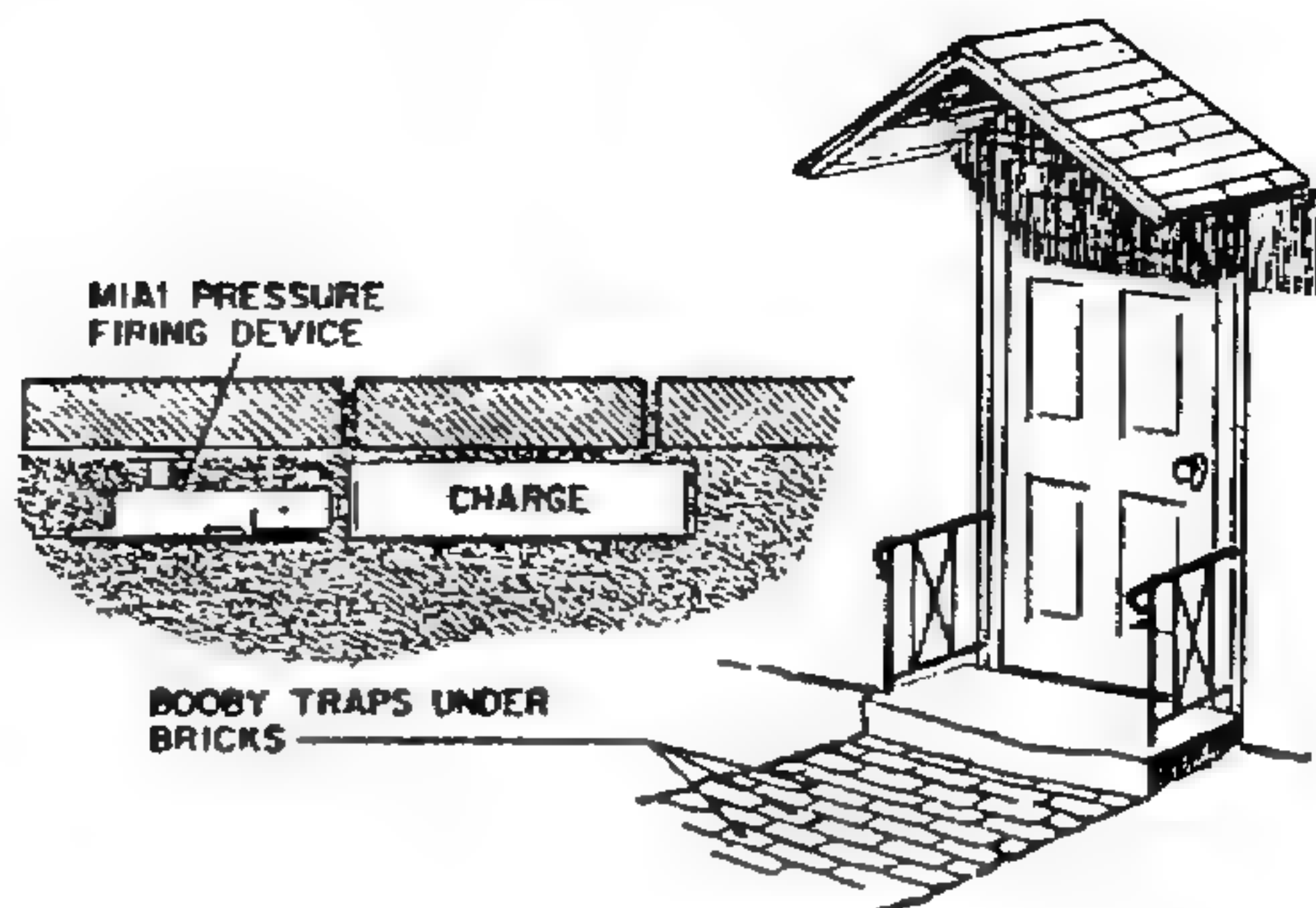
WW II GERMANY
BUCK CHEMICAL
FUZE

Acids in a vial can be used to delay explosions by using a retaining wire of fabric (short fuse) or metal (long fuse). When the glass is broken and releases the acid, a wire is corroded or eaten away which releases a spring detonating the trap.

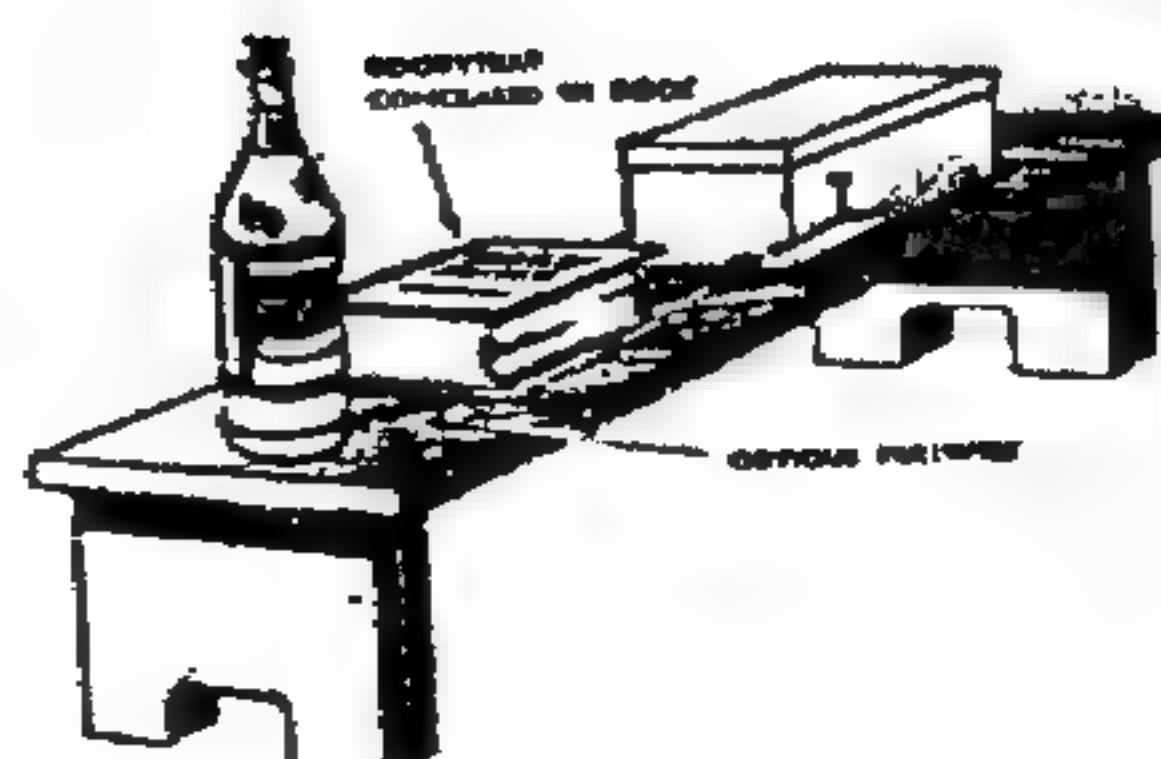
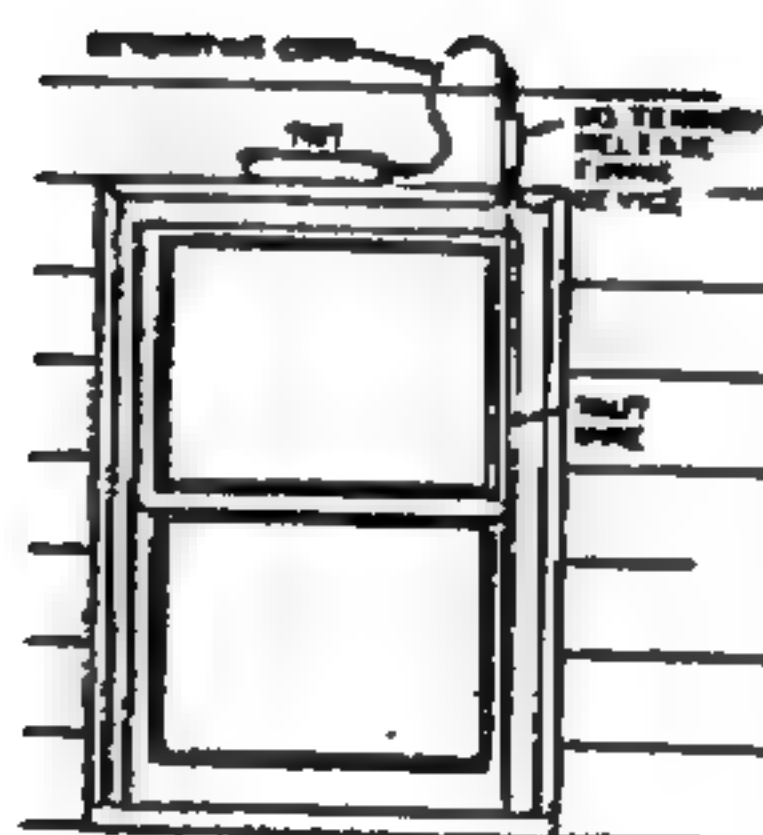


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Doors, windows, and walkways are the ideal locations to set traps for specific targets.



Lures, such as coating the device in chocolate and packaging it as candy has been used in the past. Terror weapons against civilians include trapping toys, beverages, books, and any other household materials that can camouflage the trap.

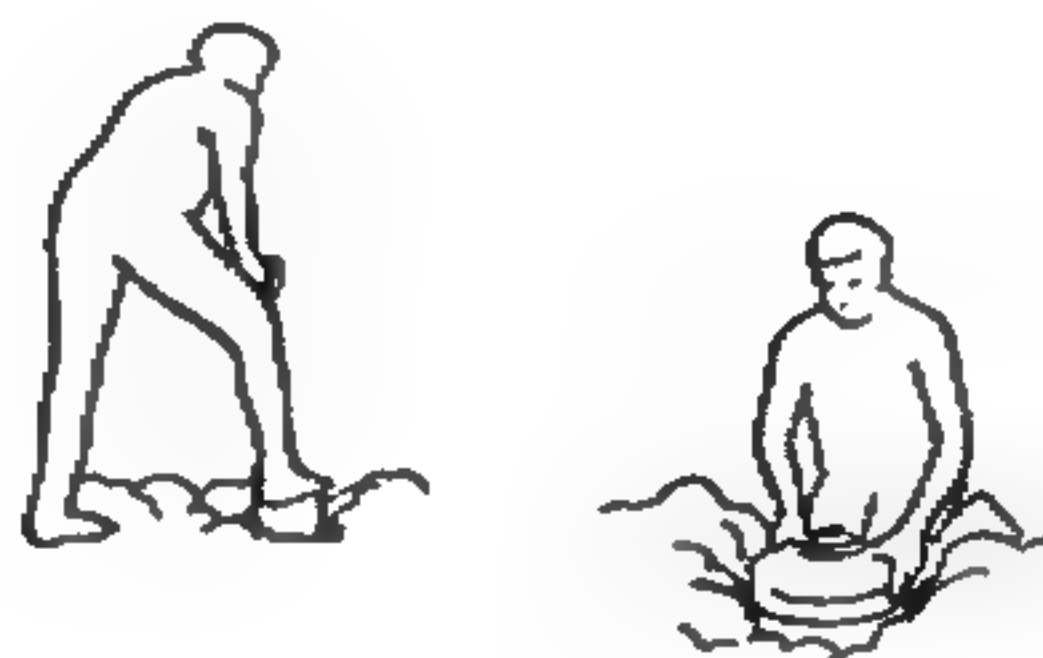


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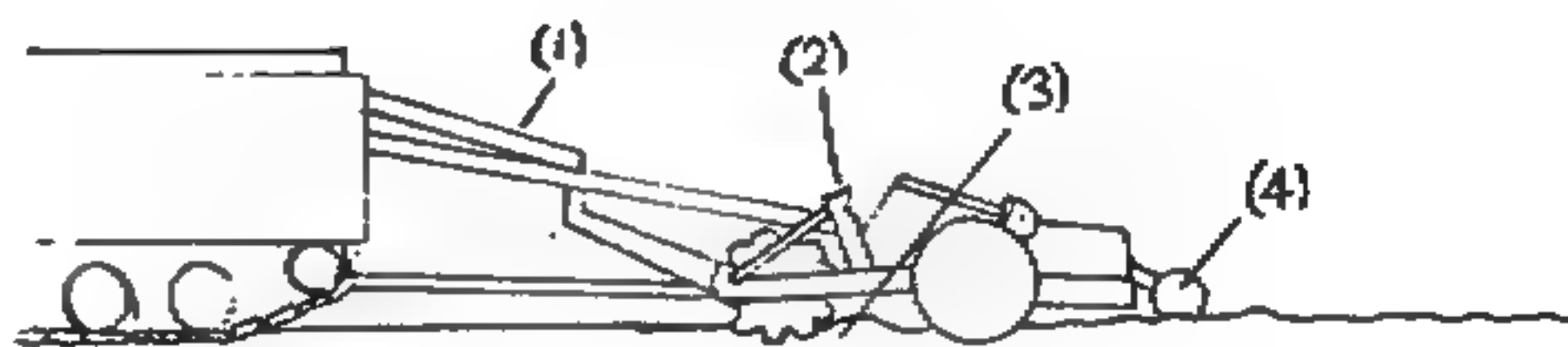
4. Mines

Mines are mass produced booby traps manufactured for the armed forces of the world. They are generally of two types, anti-personnel and anti-tank, and are much more sophisticated than common traps. Modern designs allow some mines to be dug up and reused when they are needed elsewhere. This is because the supply of mines has historically run out before all the areas they can, or should be used in were covered. In order to stop German armor in WW2, the Soviet army laid over 220 million mines which caused over 22% of all tank casualties. In Vietnam, they accounted for 73% of all tank casualties. A single platoon can lay 500-1,000 mines per night which can make their protected positions very difficult to penetrate.

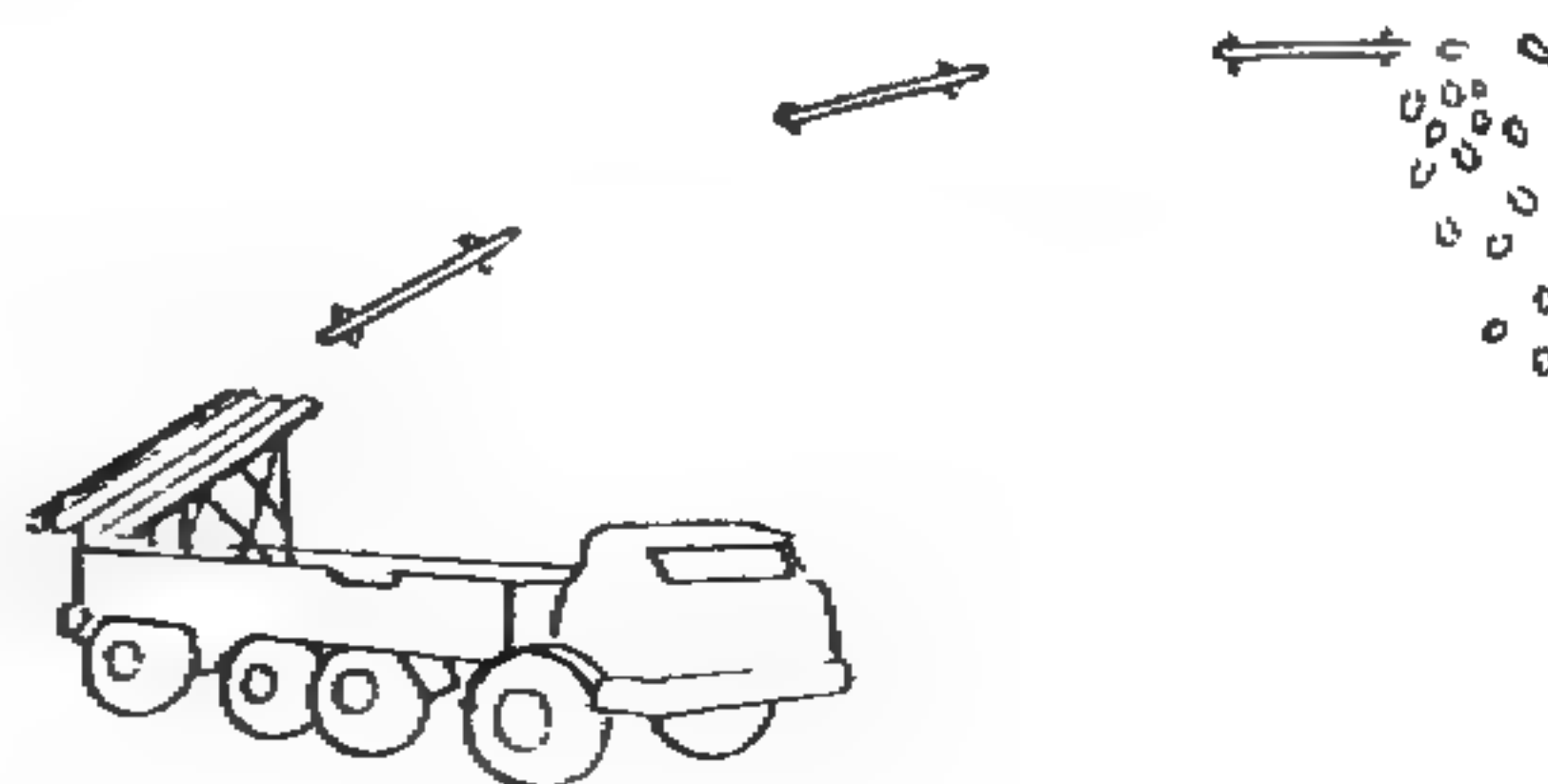
The simplest and slowest way of laying mines is by digging a spot in the ground and placing them in by hand. This individual attention makes them easy to conceal.



Many armies use mine plows to sow strips of anti-tank mines. The plow is usually towed behind an APC. The mine passes down a conveyor (1) where it is fused (2), and placed in a furrow (3) dug by the plow. A pair of discs at the rear (4) covers the furrow concealing the row of mines.

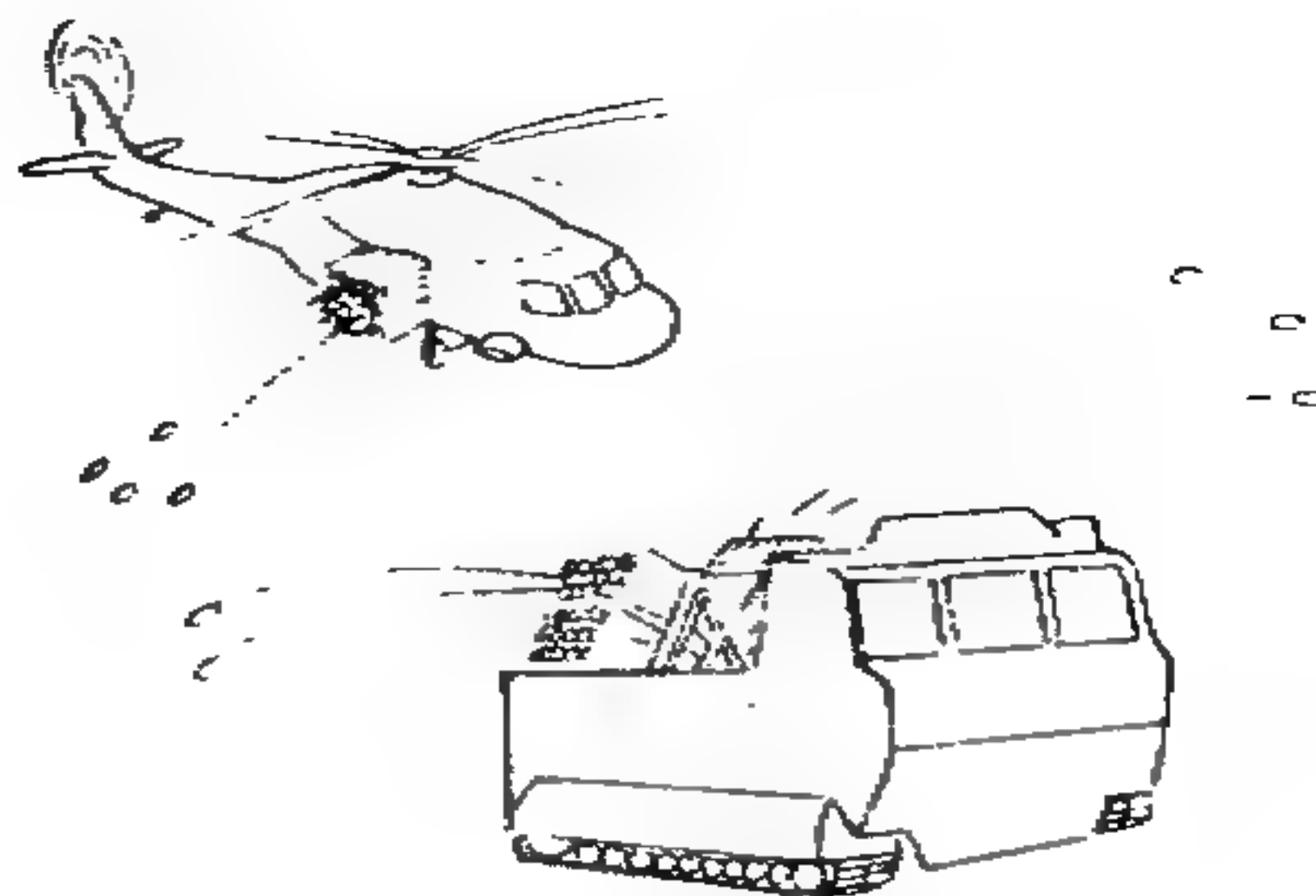


Rocket artillery can be used to deliver instant minefields up to thirty miles behind enemy lines. These are usually small mines called RDM's for "remote deployed mines". They are about the size of a grenade and generally cannot destroy a tank. They are able to knock the tracks off or damage the suspension. In addition they are capable of inflicting huge numbers of human casualties.

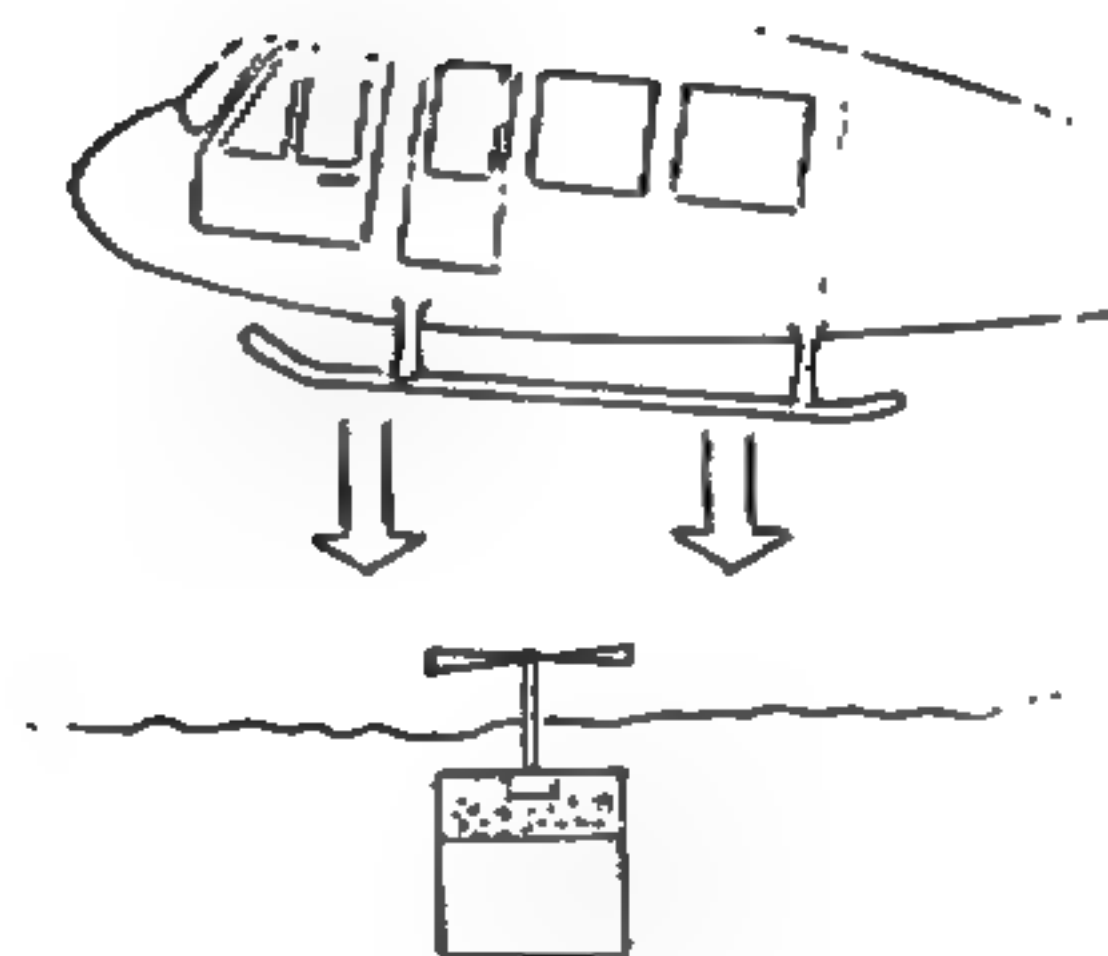


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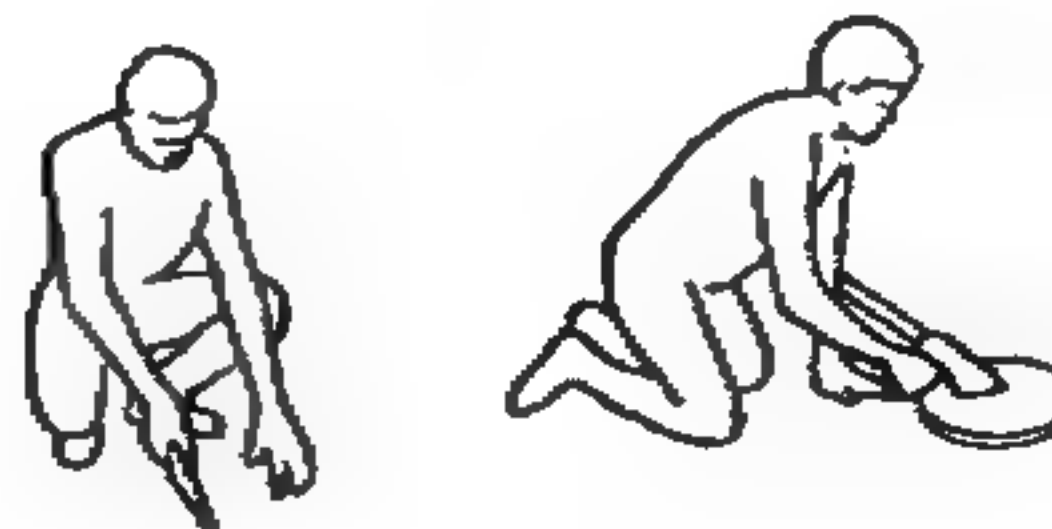
Helicopters and APC's can also lay large minefields quickly when these smaller types are used.



Anti helicopter mines were used in Vietnam with a fan blade on the top. When the fan is spun by the air wash of a helicopter, the mine is propelled upwards towards the copter and explodes about waist height. Electronics emissions and Infra Red can also be used for detonating mines.



Mines are located by probing the ground with a knife or using a metal detector. Modern mines are often made of nonmetallic materials to prevent magnetic detection.

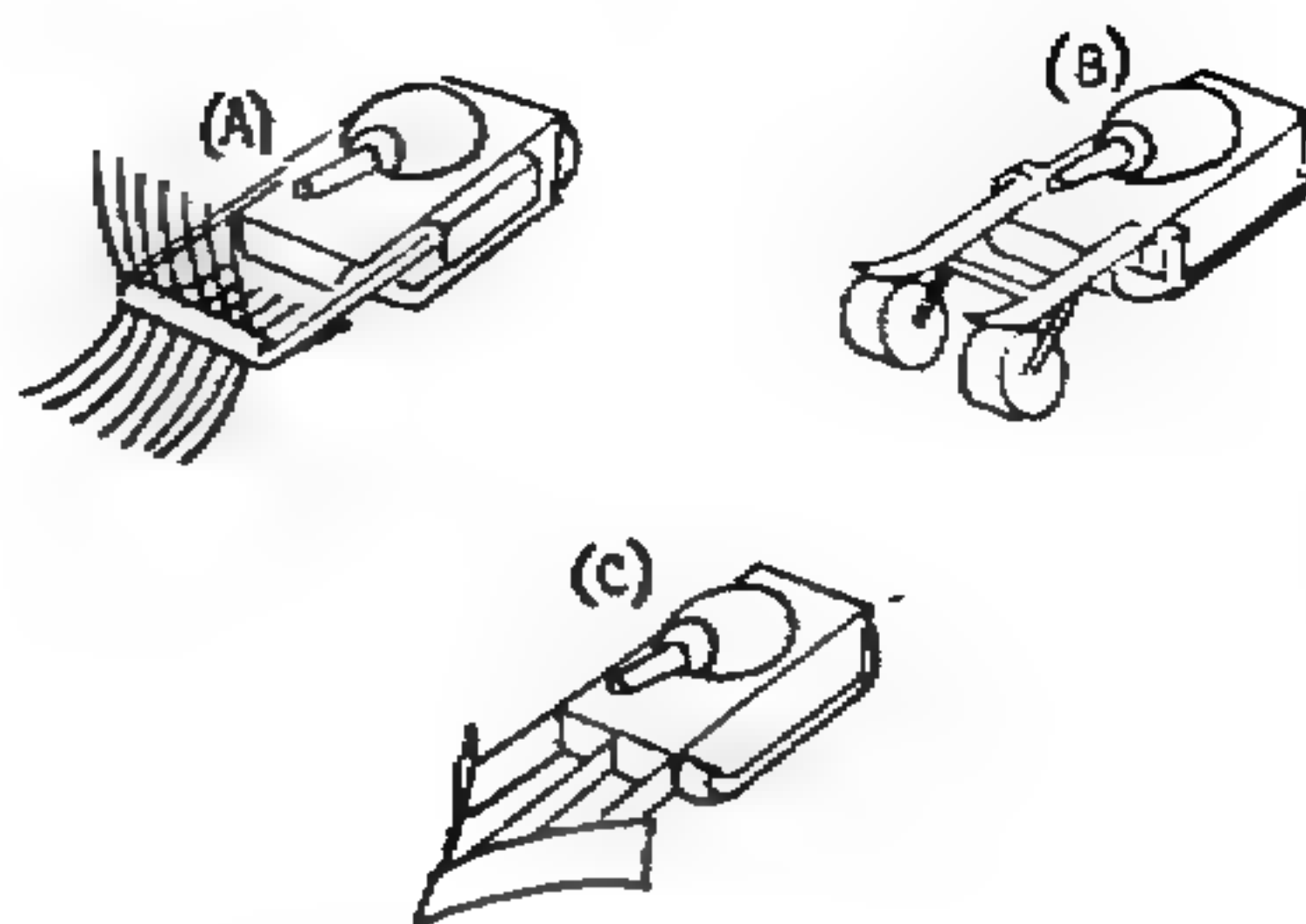


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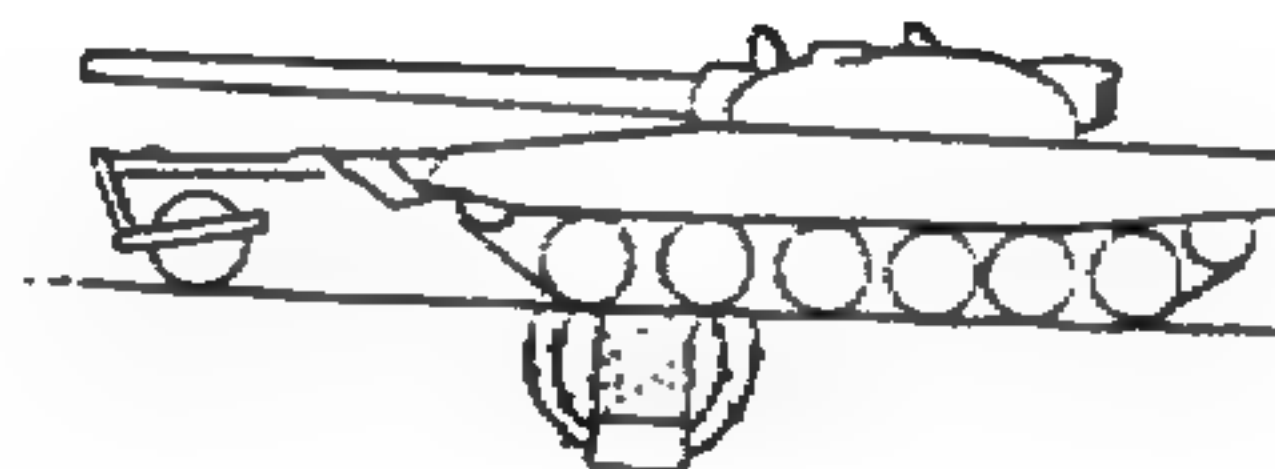
Mine clearing tanks have been designed to

- a. flail the ground with chains to cause pressure to detonate the mines
- b. Using rollers to simulate the magnetic field of an armored vehicle

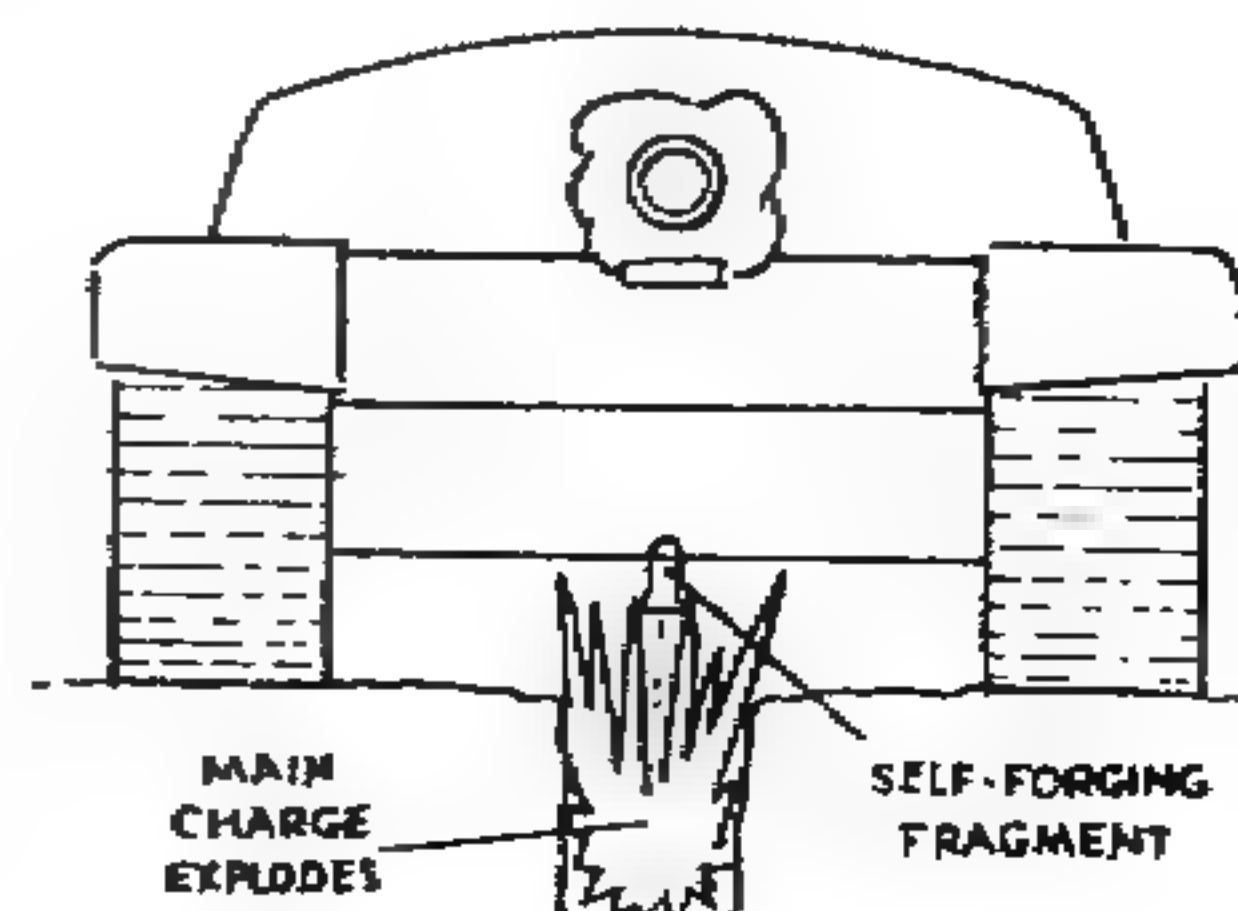
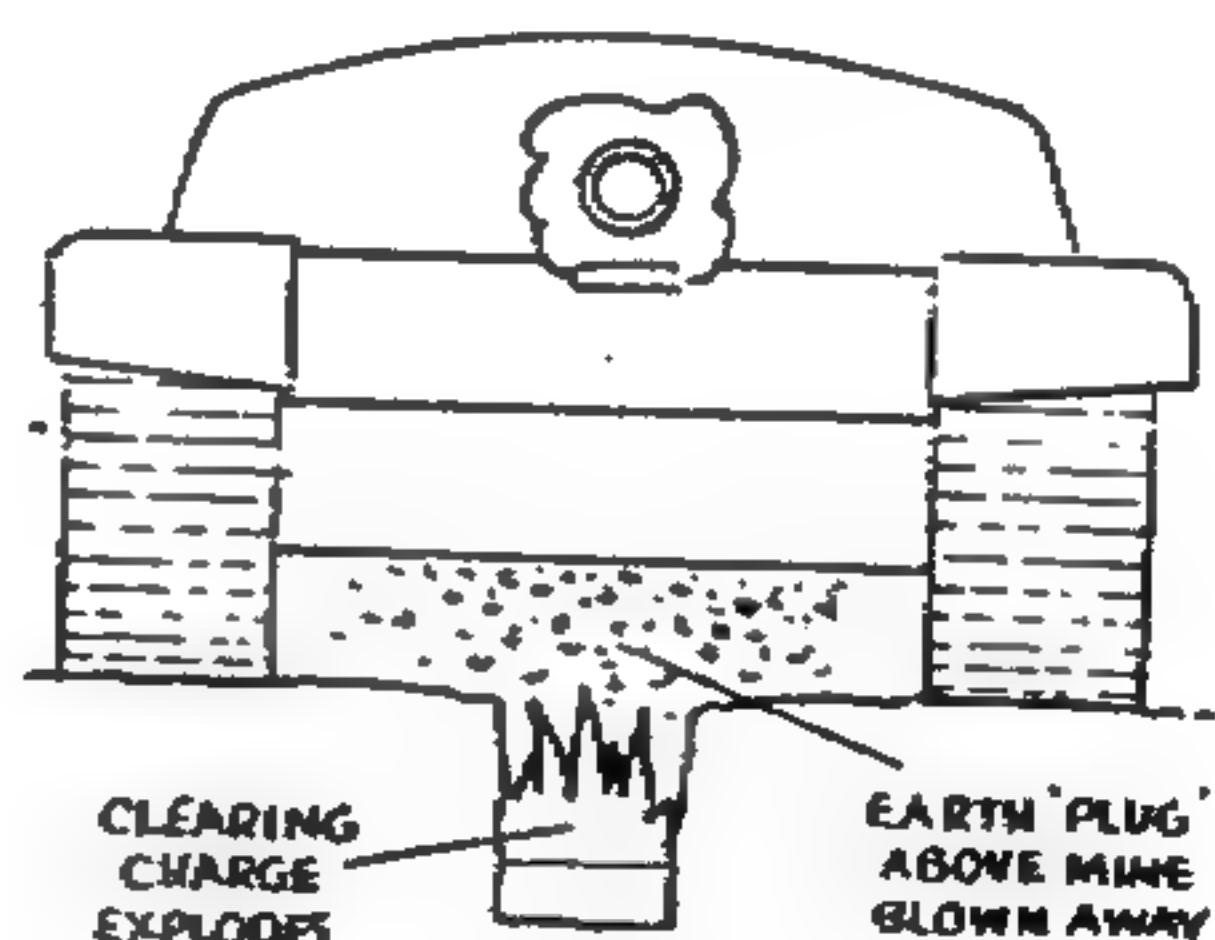
Newer mines are designed to be tripped twice to defeat these strategies. Newer ways of clearing a path includes using a plow (c) to push the ground and mines out of the way. The plow also deflects the blast of exploding mines.



During Desert Storm, the US Marines used rockets to lay hoses filled with fuel air explosives to set off all the mines in a selected path with its massive overpressure.



Sophisticated electronic mines can detect and measure the differences in the magnetic fields of different vehicles. When the desired vehicle hull is recognized, a clearance charge blows the ground overhead out of the way. The main charge is then launched towards the belly of the vehicle.



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5. Improvised positioned weapons

From the US Army Improvised Munitions Manual

a. Grenade Tin Can Land Mine

b. Mortar Scrap Mine

c. Fire Bottle Launcher

d. Electric Bulb Initiator

e. Delay Igniter from Cigarette

f. Watch Delay Timer

g. No Flash Fuse Igniter

h. Dried Seed Timer

j. Fuse Cords

k. Clothespin Time Delay Switch

l. Time Delay Grenade

m. Detonator

n. Can Liquid Time Delay

Scientific Principles of Improvised Warfare and Home Defense

a. Grenade Tin Can Land Mine

This device can be used as a land mine that will explode when the trip wire is pulled

Material Required

Hand grenade with side safety lever

Sturdy container, open at one end, that is just large enough to fit over grenade and its safety lever (tin can of proper size is suitable)

Strong string or wire

NOTE: The container must be small enough to prevent the safety lever from springing open. One end must be completely open.

Procedure

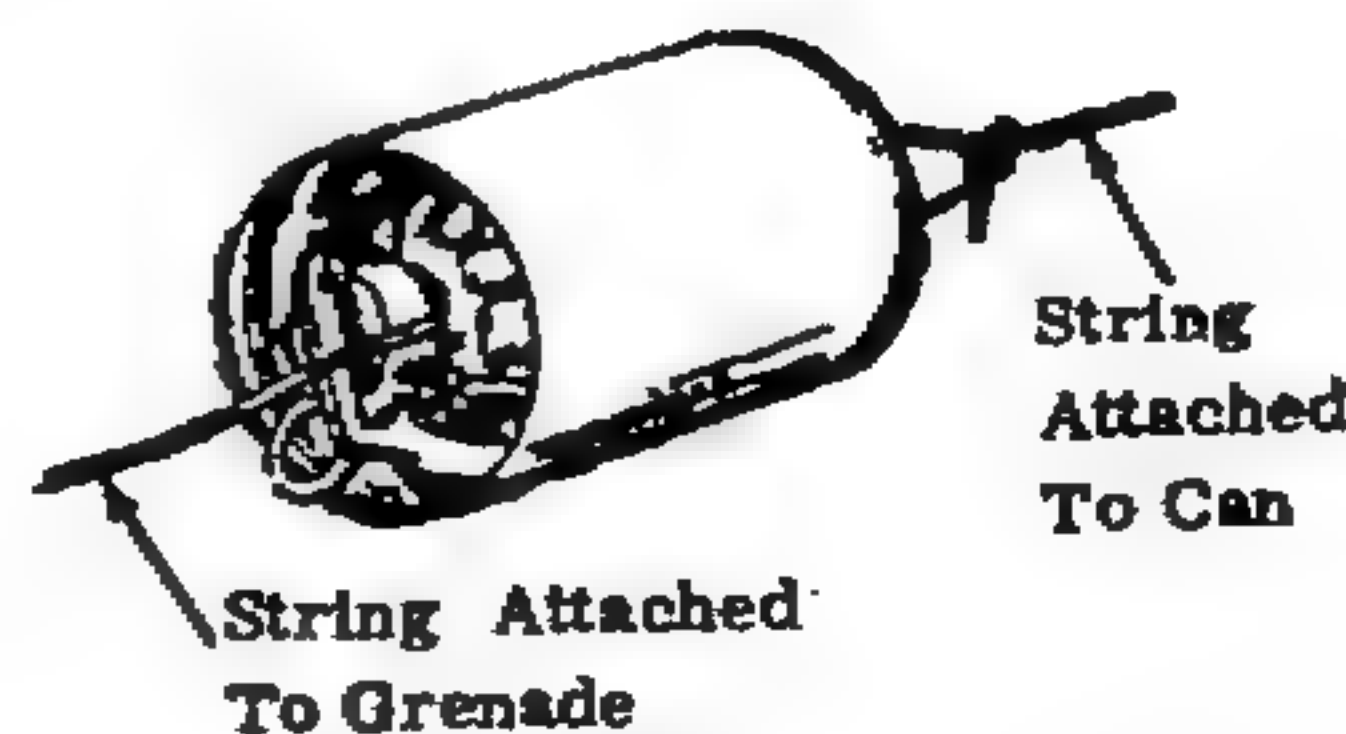
1. Fasten one piece of string to the closed end of the container, making a strong connection. This can be done by punching 2 holes in the can, looping the string through them, and tying a knot.



2. Tie free end of this string to a bush, stake, fencepost, etc.



3. Fasten another length of string to the grenade so that it cannot interfere with the functioning of the ignition mechanism of the grenade.



4. Insert grenade into container.

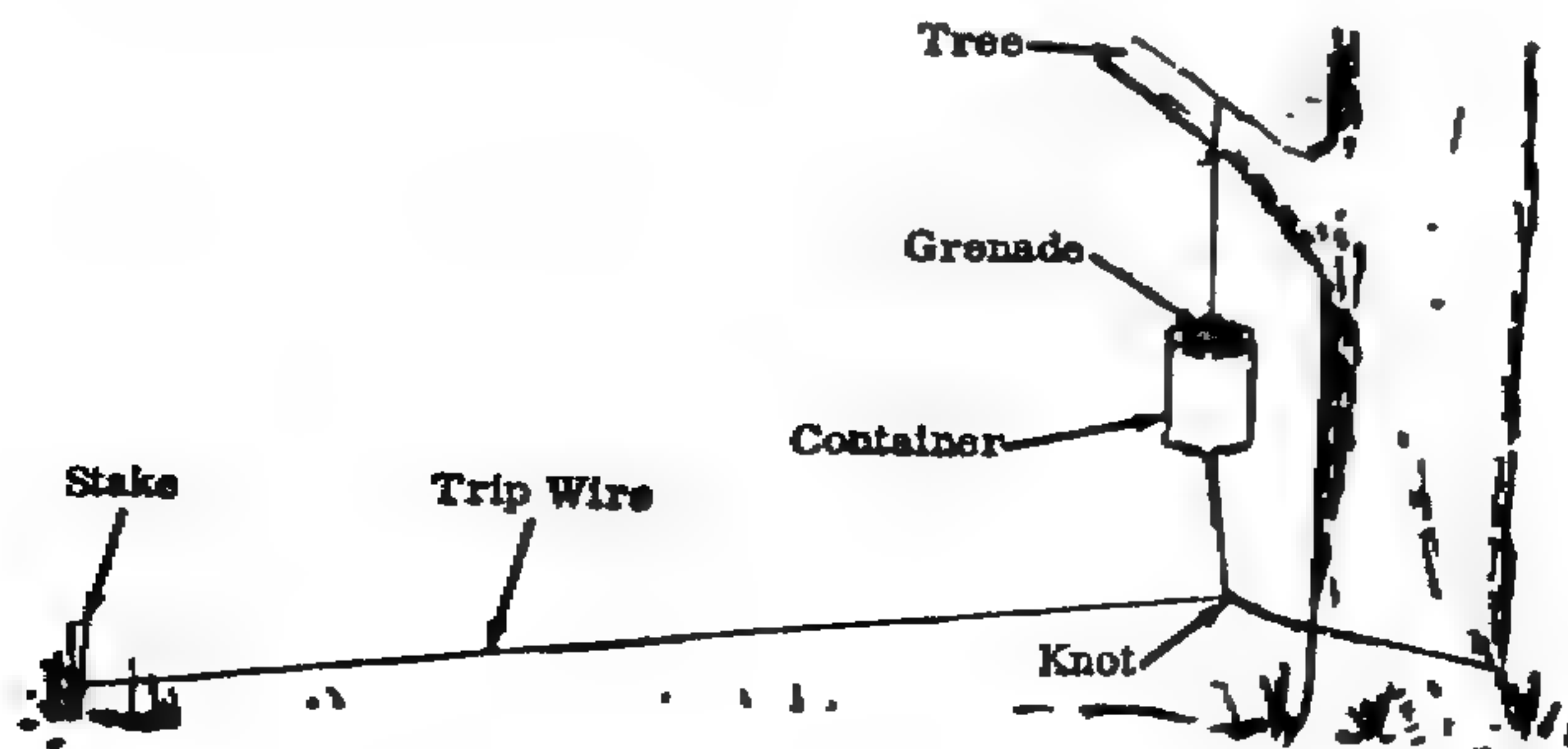
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5. Lay free length of string across path and fasten to stake, bush, etc. The string should remain taut.



How to use

1. Carefully withdraw safety pin by pulling on ring. Be sure safety lever is restrained during this operation. Grenade will function in normal manner when trip wire is pulled.



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b. Mortar Scrap Mine

A directional shrapnel launcher that can be placed in the path of advancing troops

Material Required

Iron pipe app. 3 ft. long and 2-4" in diameter and threaded on at least one end. Salvaged artillery cartridge case may be used.

Threaded cap to fit pipe.

Black powder or salvaged artillery propellant about 1/2 pound total.

Electrical igniter. Safety or improvised fuse may also be used.

Small stones about 1" in diameter or small size scrap; about one pound total.

Bags for wadding, each about 20"x20".

Paper or bag

Battery and wire

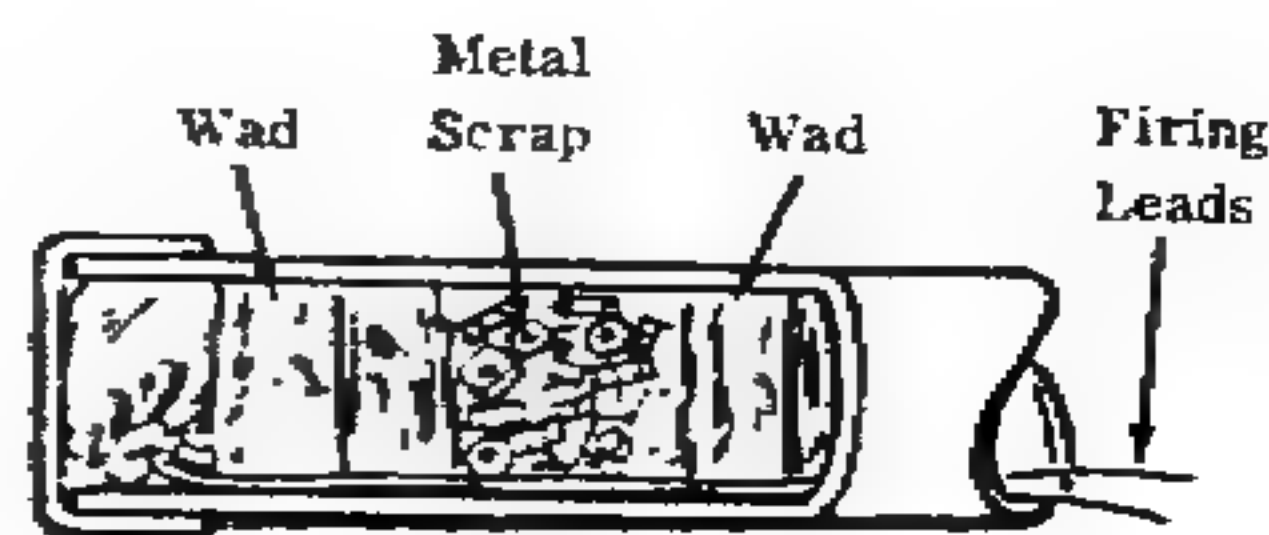
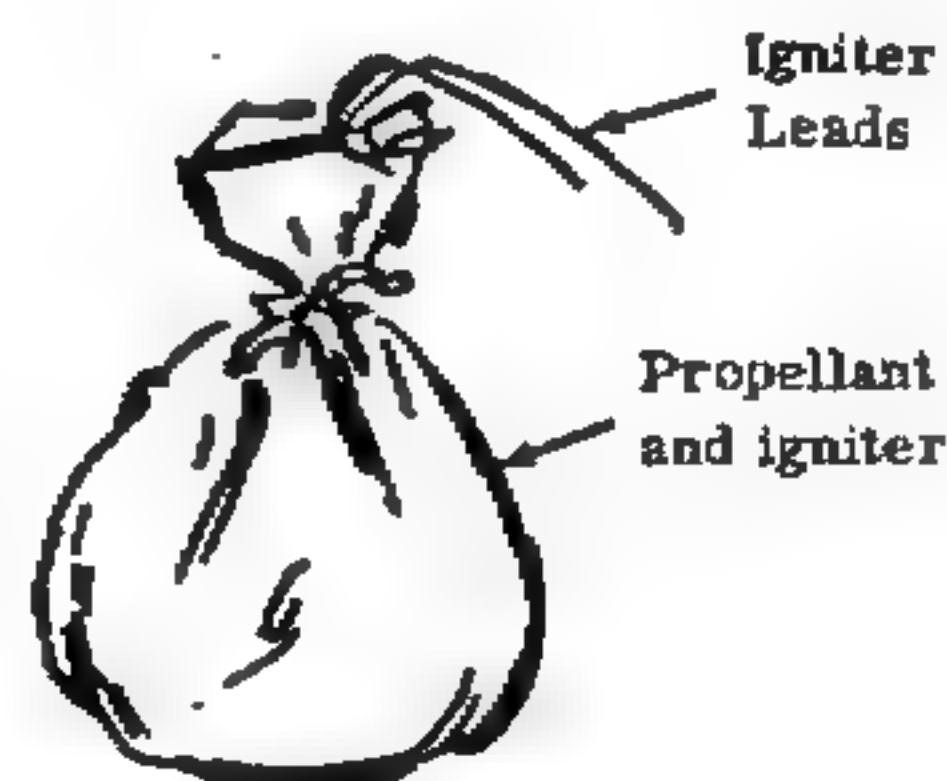
Stick (non metallic)

NOTE: Be sure pipe has no cracks or flaws



Procedure

1. Screw threaded cap onto pipe.
2. Place propellant and igniter in paper or rag and tie package with string so contents will not fall out.
3. Insert packaged propellant and igniter into pipe until package rests against threaded cap leaving firing leads extending from open end of pipe.
4. Roll rag till it is about 6" long and the same diameter as pipe. Insert rag wadding against packaged propellant igniter. With caution, pack tightly using stick.
5. Insert stones and/or scrap metal into pipe.
6. Insert second piece of rag wadding against stones and/or metal scrap. Pack tightly as before.



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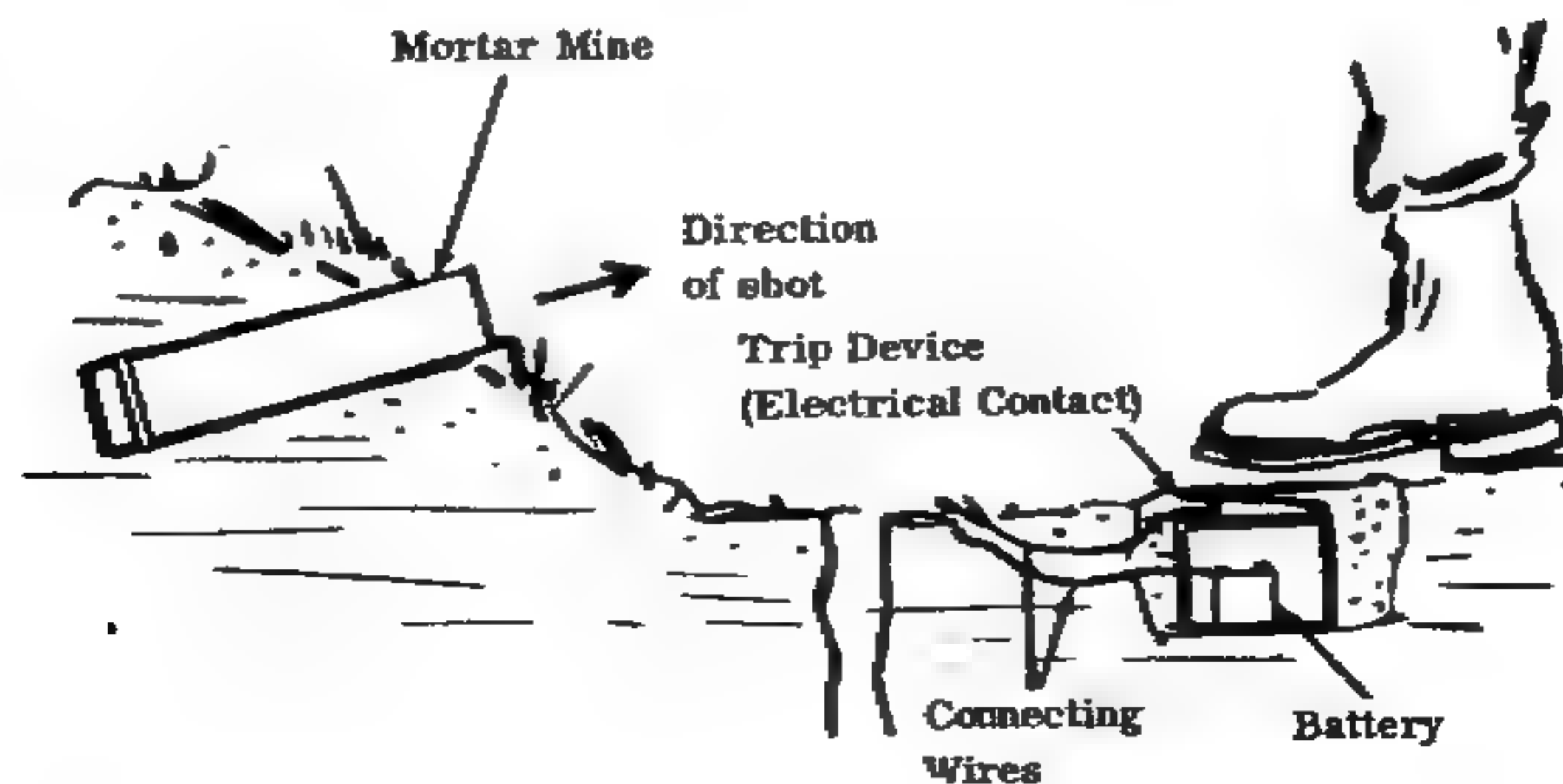
How to use

1. Bury pipe in ground with open end facing the expected path of the enemy. The open end may be covered with cardboard and a thin layer of dirt or leaves as camouflage.
2. Connect firing leads to battery and switch. Mine can be remotely fired when needed or attached to trip device placed in path of advancing troops.



NOTE: A non electrical ignition system may be substituted for the electrical ignition system as follows.

1. Follow above procedure, substituting safety fuse for igniter.
2. Light safety fuse when ready to fire.



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C. Fire Bottle Launcher

A device using 2 items (shotgun and chemical fire bottle) that can be used to start or place a fire 80 yards from launcher.

Material required

Standard 12 gauge or improvised shotgun
Improvised fire bottle (Incendiary chapter)
Tin can, about 4" in diameter and 5-1/2" high
Wood, about 3" x 3" x 2"
Nail, at least 3" long
Nuts and bolts, or nails, at least 2-1/2" long
Rag
Paper
Drill

If Standard Shotgun is Used

Hard wood stick, about the same length as shotgun barrel and about 5/8" in diameter. Stick need not be round.
2 washers, having outside diameter of 5/8"
Rubber disk, 3/4" in diameter and 1/4" thick. Leather or cardboard can be used.
12 gauge shotgun ammunition

If Improvised Shotgun is Used

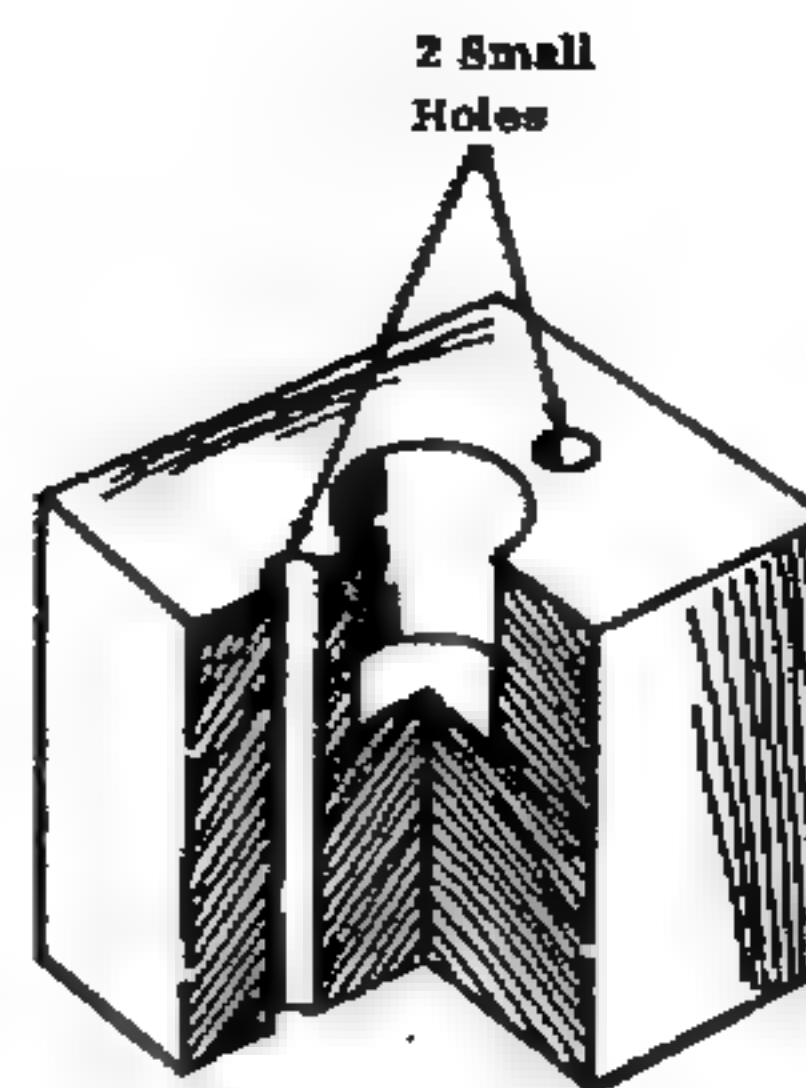
Fuse, safety or improvised fast burning
Hard wood stick, 3/4" in diameter and about same length as the shotgun barrel
Black powder- 9 grams (135 grains)

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Procedure

Method 1 - If Improvised Shotgun is Used

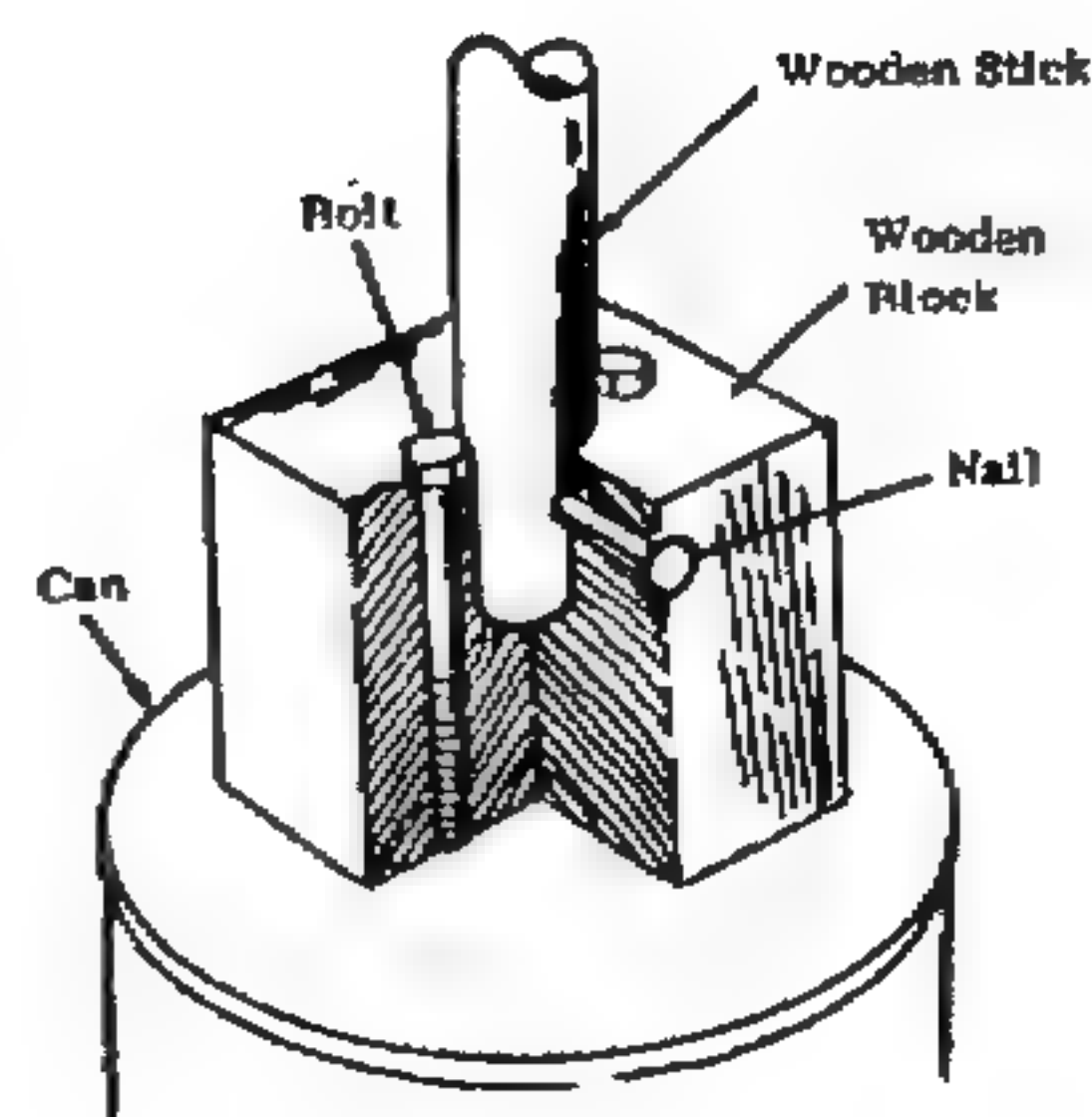
1. Drill 2 small holes in center of wood block app. 1" deep. Hole should have app. the same diameter as the wooden stick.



2. Drill 2 small holes on opposite sides of the wooden block. Hole should be large enough for bolts to pass through.

3. Fasten can to block with nuts and bolts.

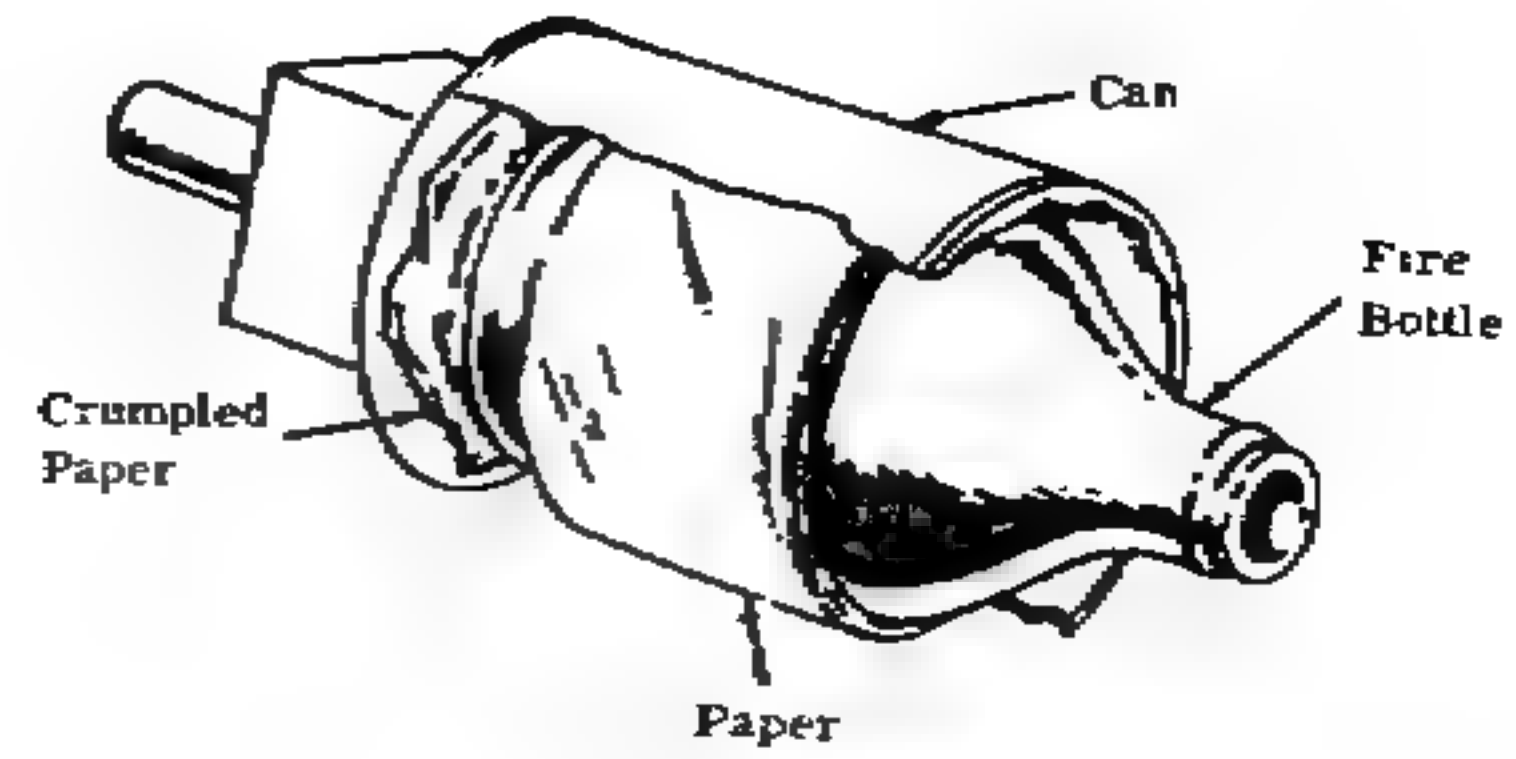
NOTE: Can may also be securely fastened to block by hammering several nails through can and block. Do not drill holes, and be careful not to split wood.



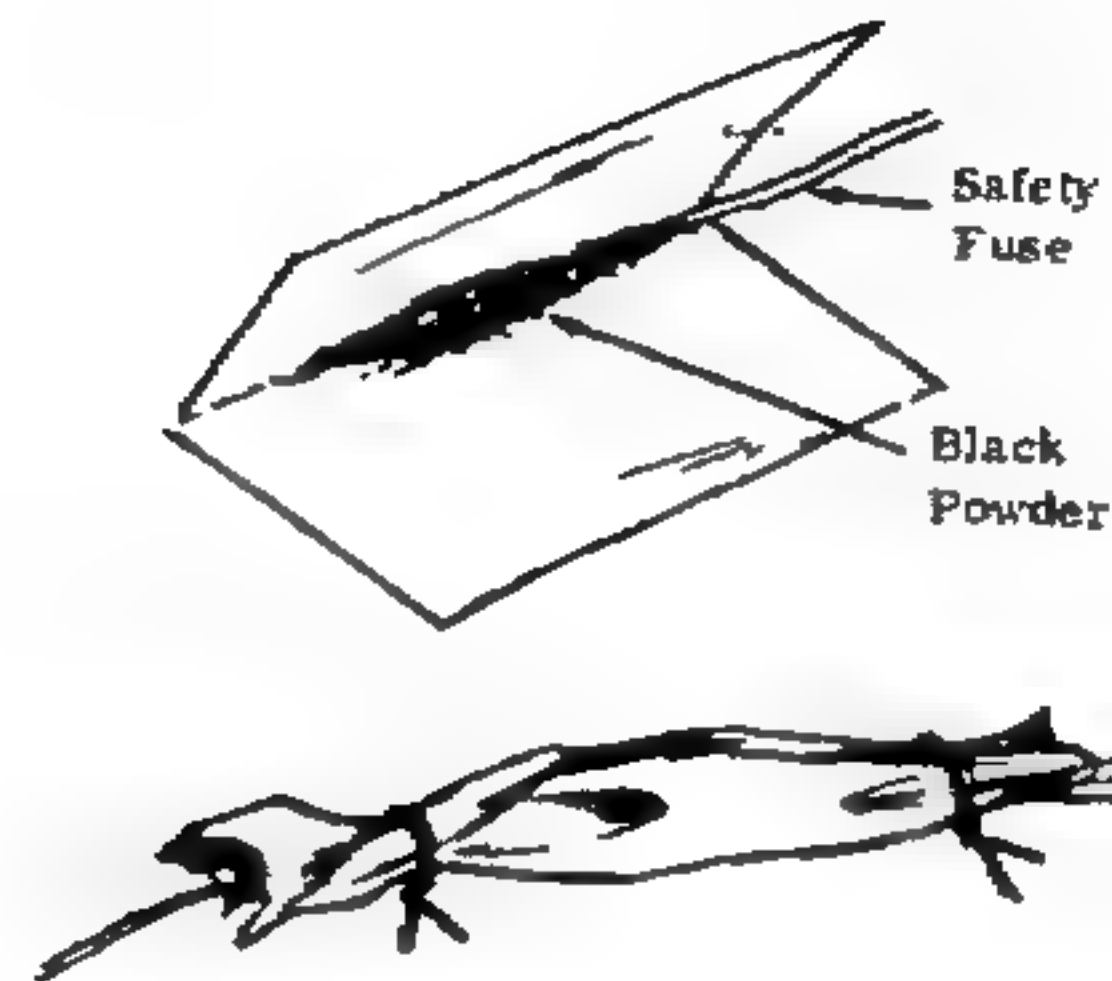
4. Place wooden stick into hole in wooden block. Drill small hole (same diameter as that of the 3" nail) through wooden block and through wooden stick. Insert nail in hole.

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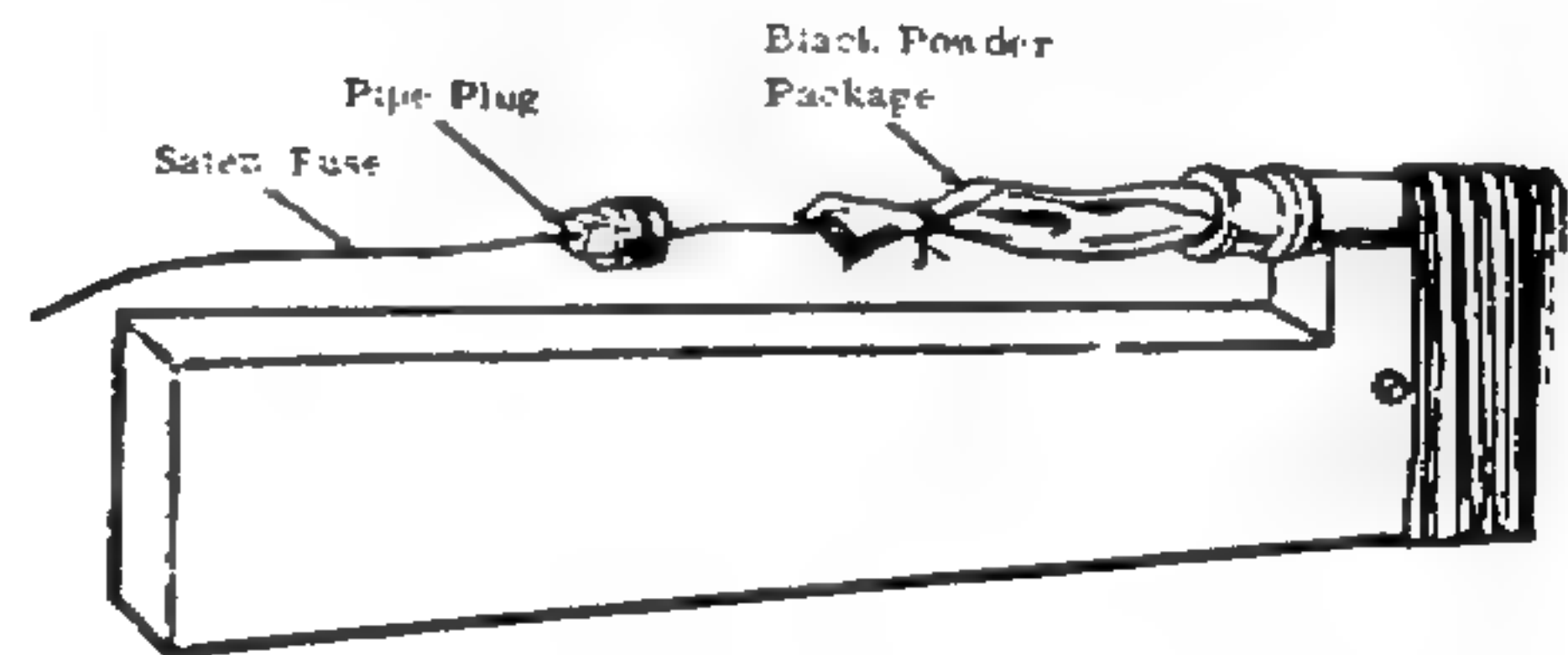
5. Crumple paper and place in bottom of can. Place another piece of paper around fire bottle and insert in can. Use enough paper so that bottle will fit snugly.



6. Place safety fuse and black powder on paper. Tie each end with string.



7. Thread fuse through hole in plug. Place powder package in rear of shotgun. Screw plug finger tight into coupling.



NOTE: Hole in plug may have to be enlarged for fuse.

8. Insert rag into front of shotgun. Pack rag against powder package with stick. **USE CAUTION.**

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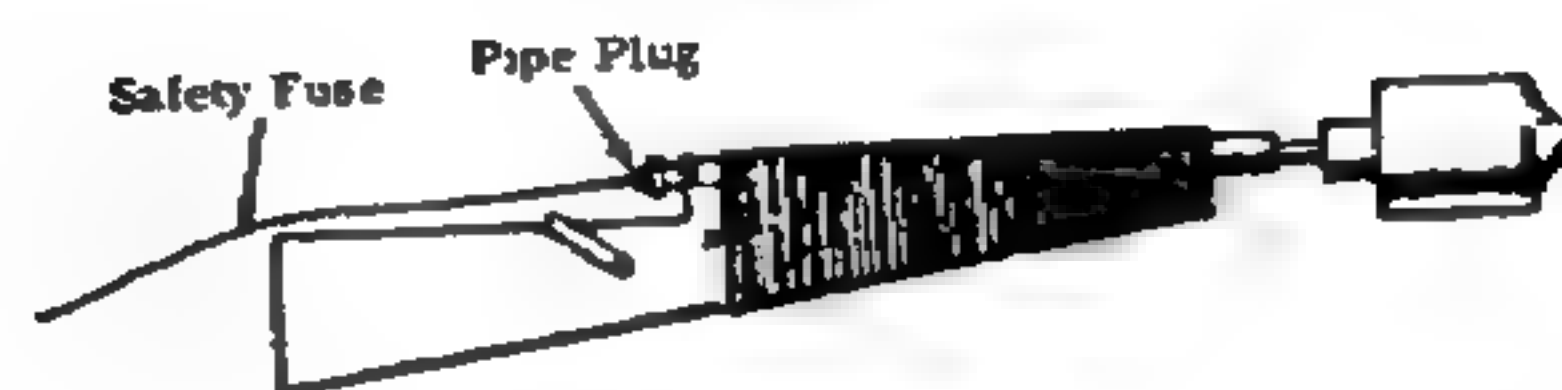
Method II - If Standard Shotgun is Used

1. Follow steps 1 and 2 of shotgun grenade launcher
2. Follow procedure of method 1, steps 1-5.
3. Follow steps 9-11 of shotgun grenade launcher (chapter 4) using 1/3 of total propellant instead of 1/2.
4. Load cartridge in gun.

How to use

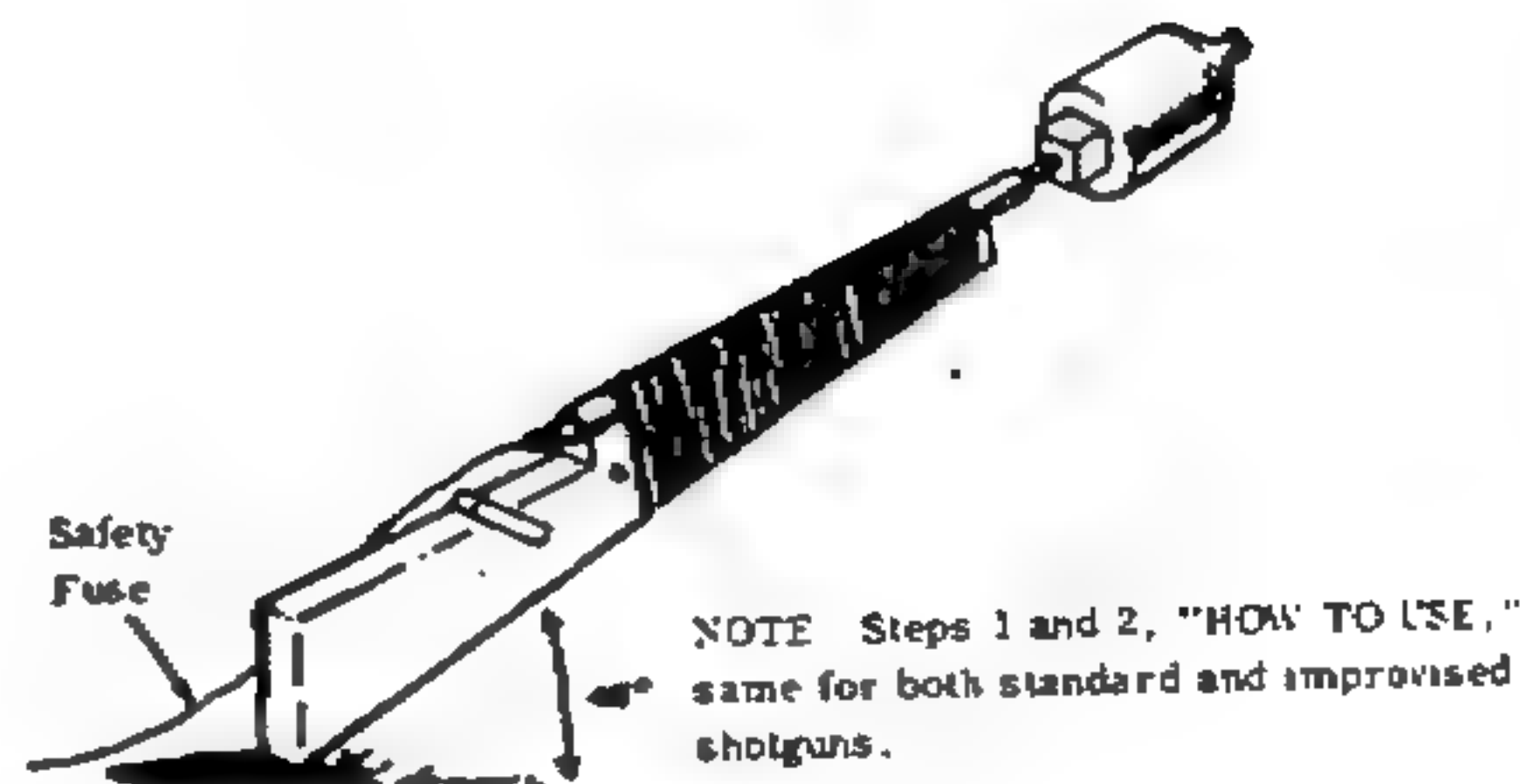
1. Insert stick and holder containing chemical fire bottle.

Caution: Do Not tilt muzzle downward



2. Hold gun against ground at 45 degree angle and light fuse.

Caution: Severe burns may result if bottle shatters when fired. If possible, obtain a bottle identical to that being used as the fire bottle. Fill about 2/3 full of water and fire as above. If bottle shatters when fired instead of being launched intact, use a different type of bottle.



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d. Electric Bulb Initiator

Mortar, mines and similar weapons often make use of electric initiators. An electric initiator can be made using a flashlight or automobile electric light bulb.

Material Required

Electric light bulb and mating socket
Cardboard or heavy paper
Black Powder
Adhesive tape

Procedure

Method 1

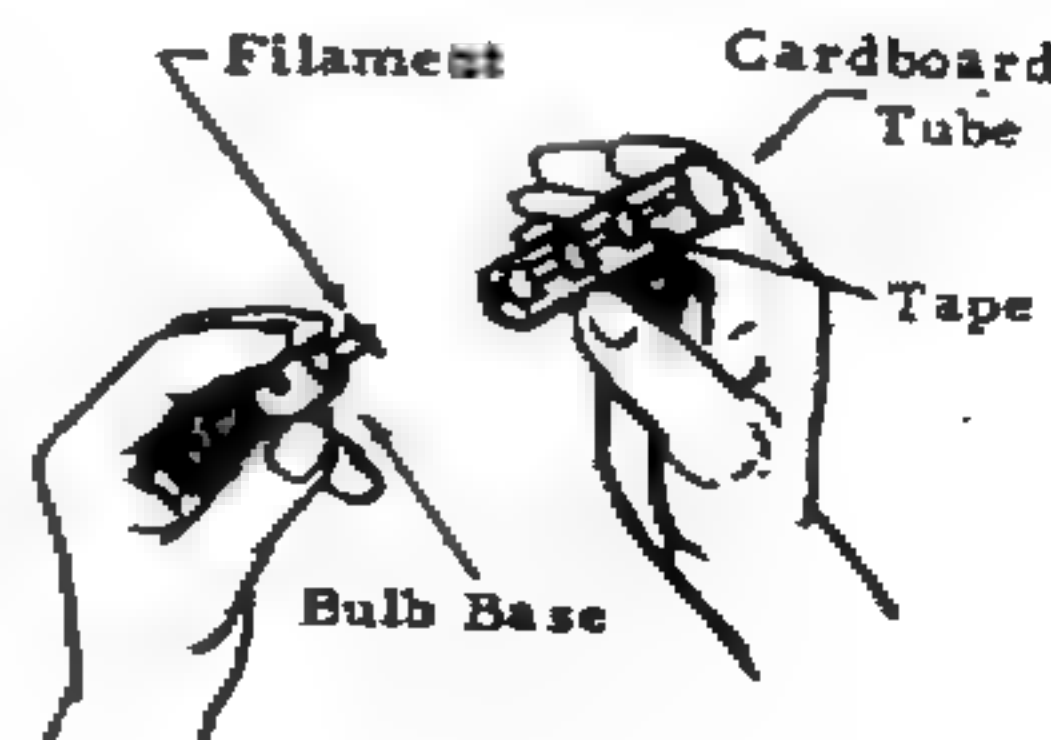
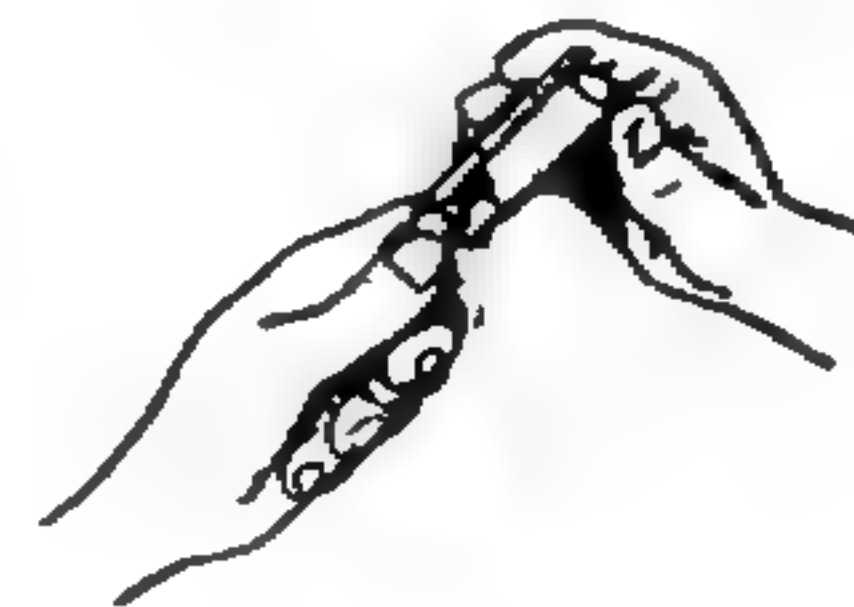
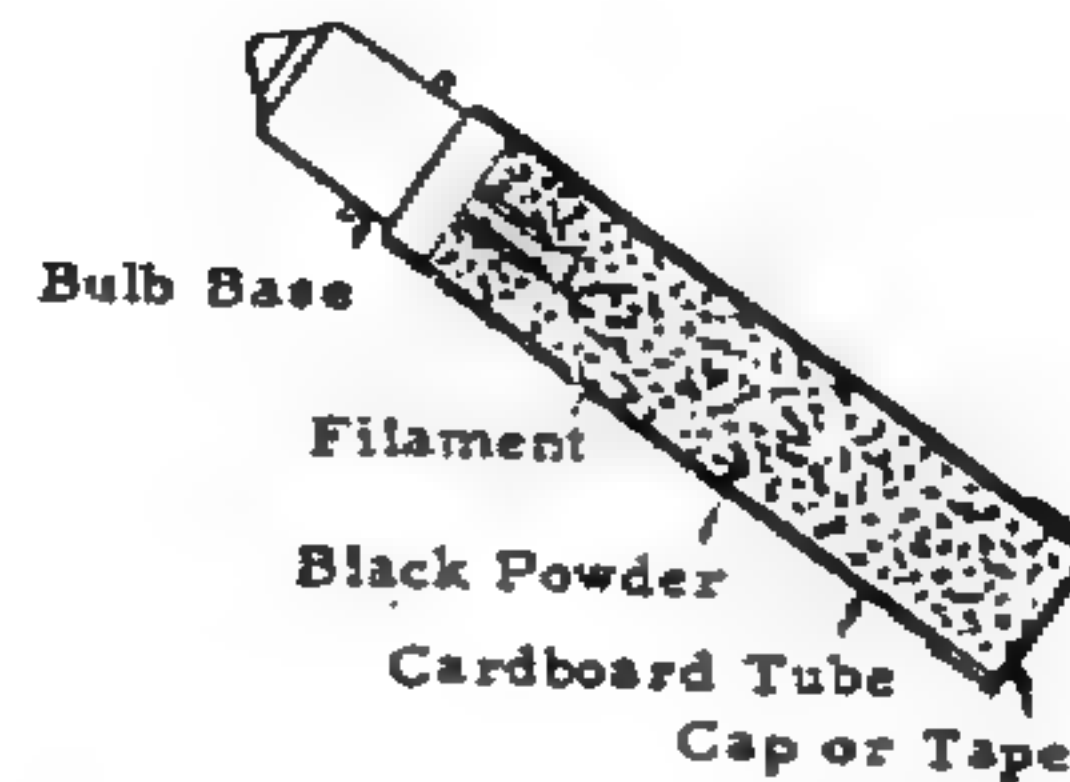
1. Break the glass of the electric light bulb. Take care not to damage the filament. The initiator will not work if the filament is broken. Remove all glass above the base of the bulb.

2. Form a tube 3-4" long from cardboard or heavy paper to fit around the base of the bulb.

3. Fit the tube to the bulb base and tape into place.

Make sure that the tube does not cover that portion of the bulb base that fits into the socket.

4. If no socket is available for connecting the initiator to the firing circuit, solder the connecting wires to the bulb base.



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CAUTION: Do not use a hot soldering iron on the completed igniter since it may ignite the black powder.

5 Fill the tube with black powder and tape the open end of the tube closed.

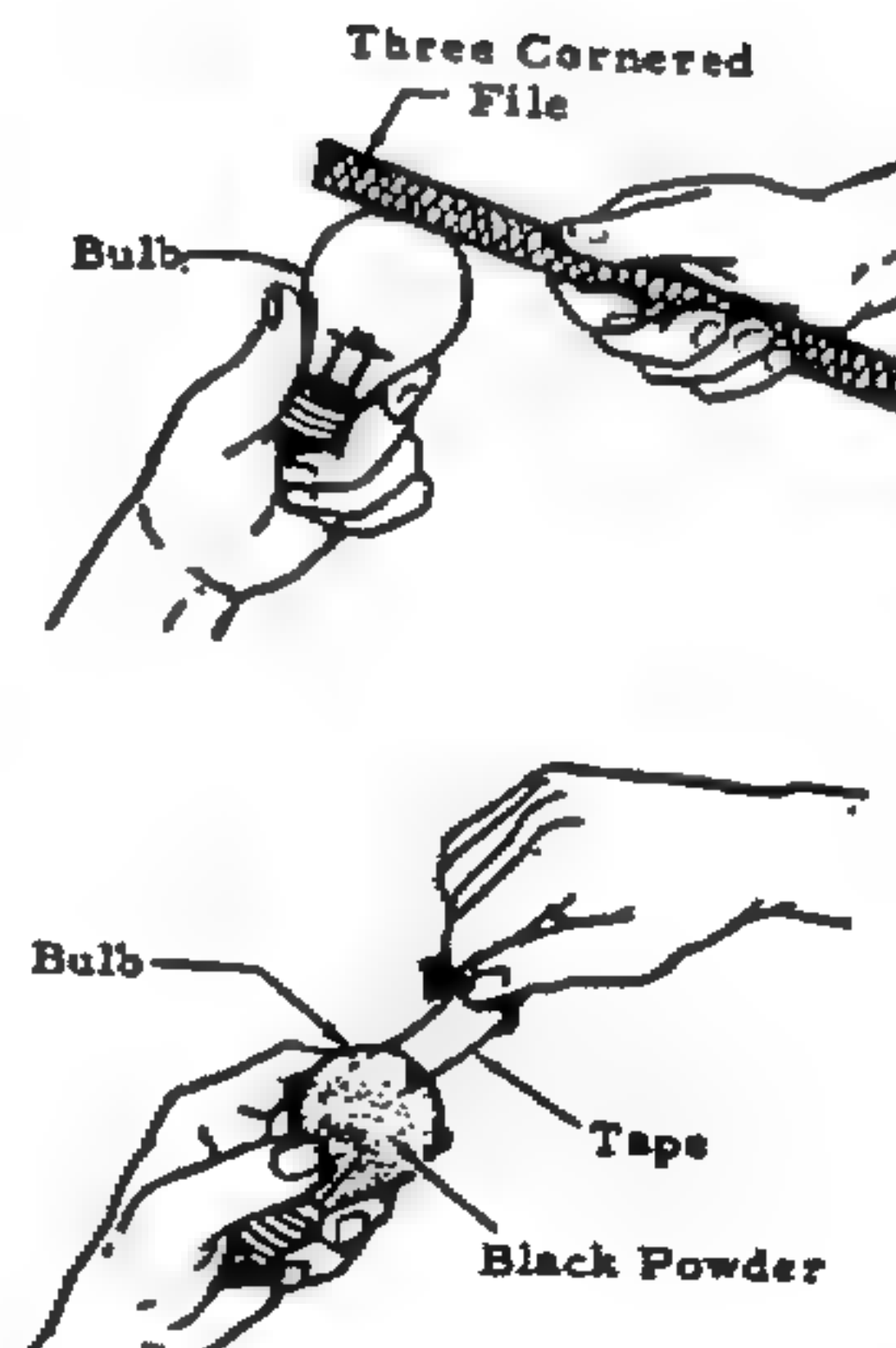
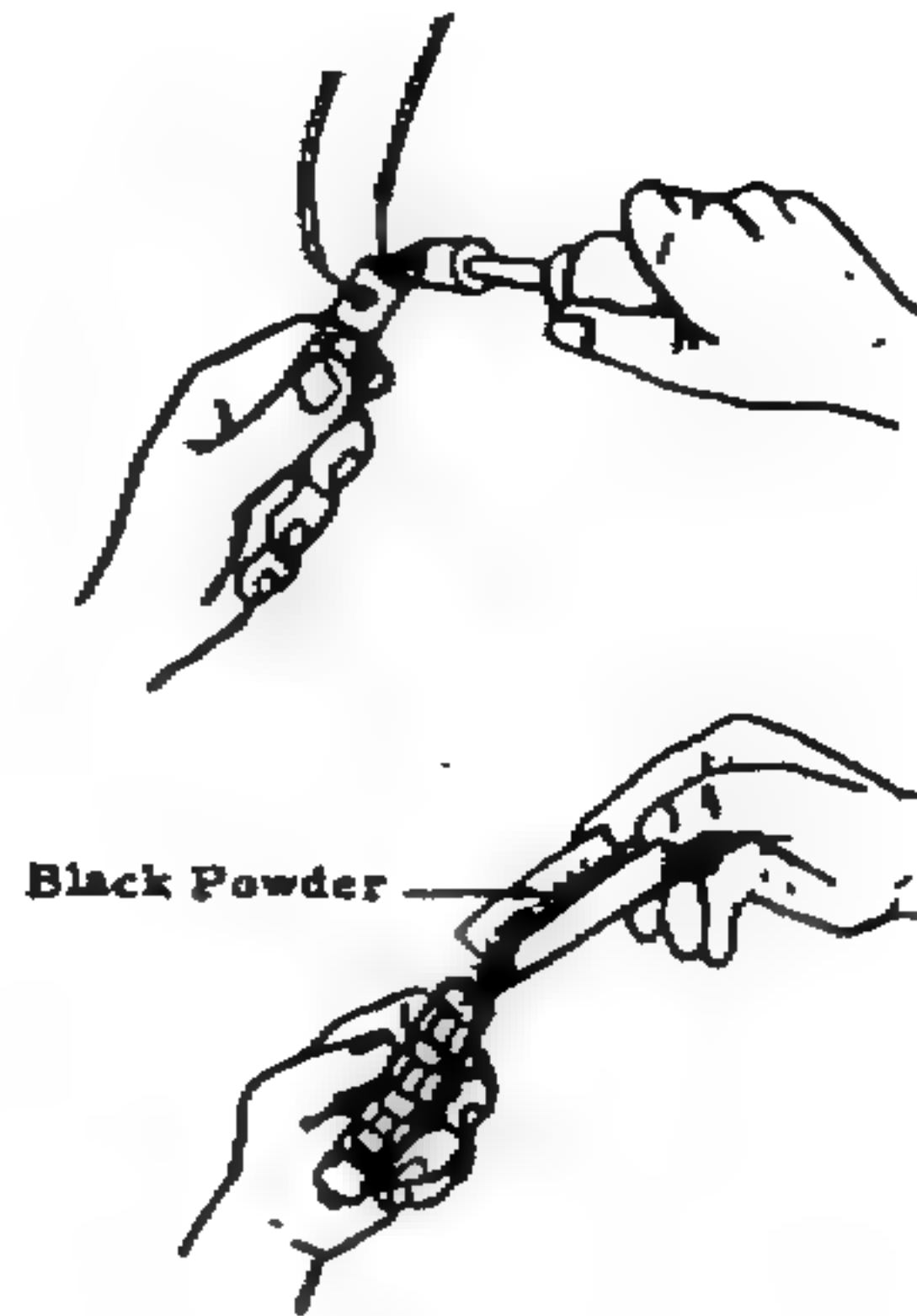
Method II

If the glass bulb is large enough to hold the black powder, it can be used as the container.

Procedure

1. Fill a small hole in the top of the bulb.

2. Fill the bulb with black powder and tape the hole closed.



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e. Delay Igniter From Cigarette

A simple and economical time delay can be made with a common cigarette

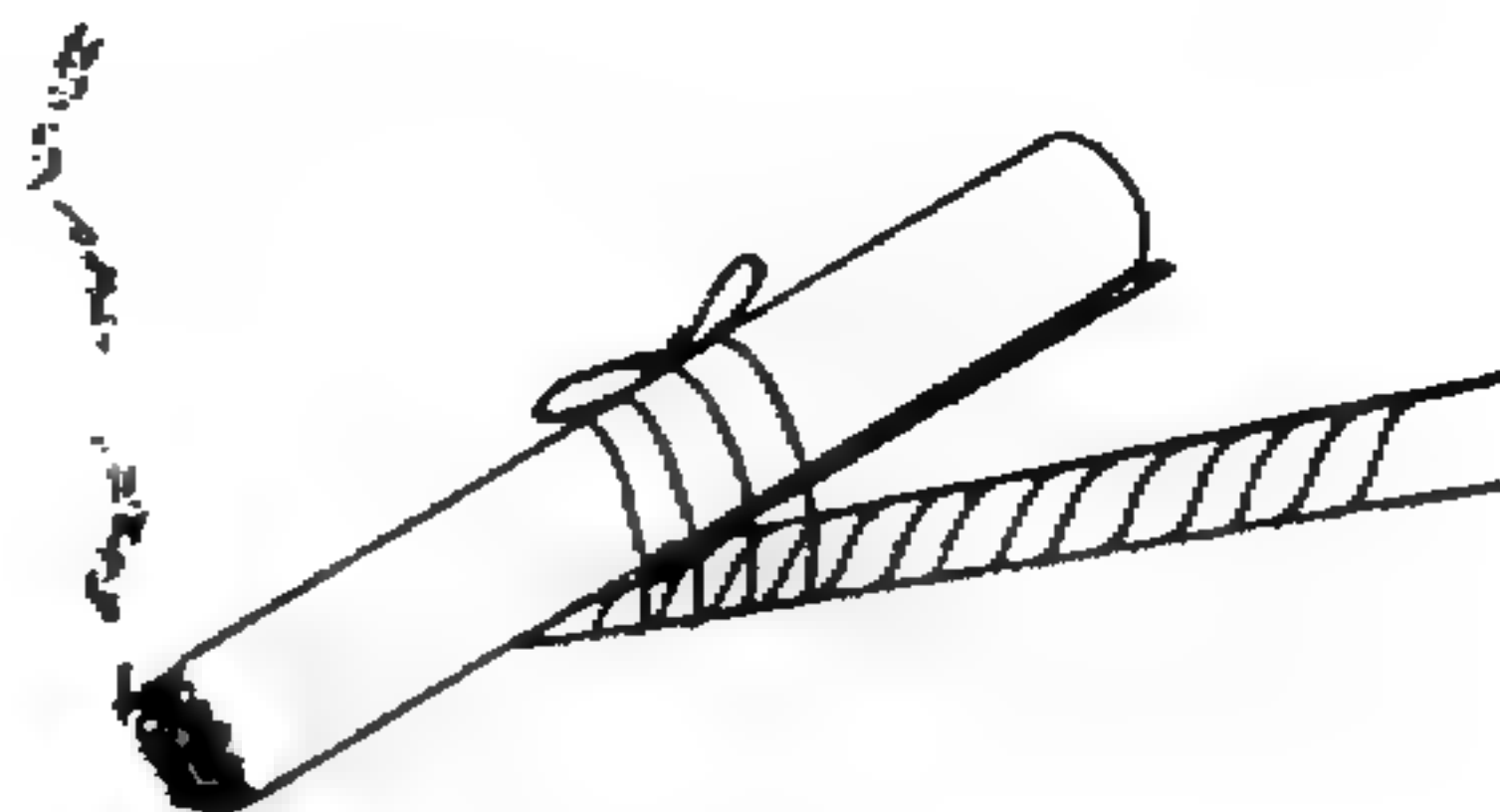
Materials Required

Cigarette

Paper match

String (shoelace or similar cord)

Fuse Cord (improvised or commercial)

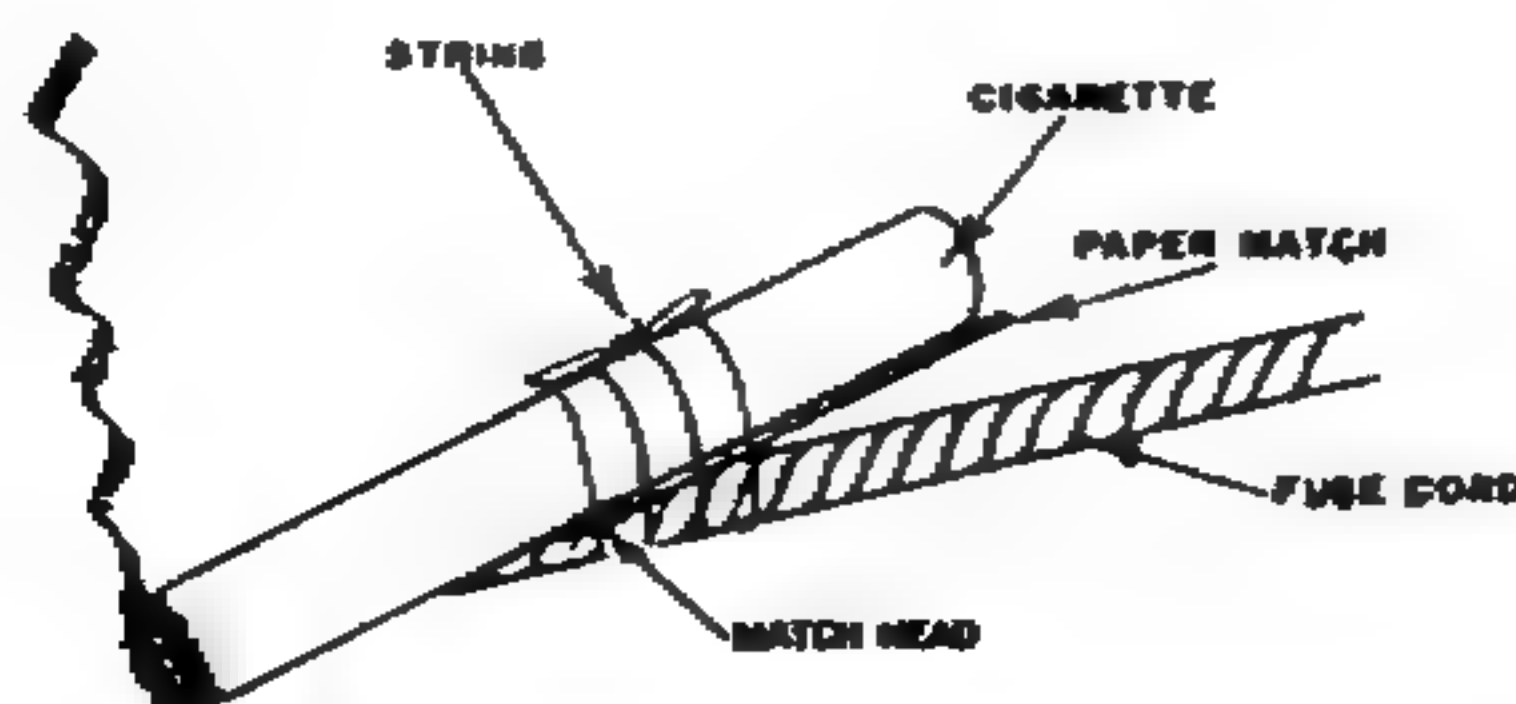


Procedure

1. Cut end of fuse cord to expose inner core.



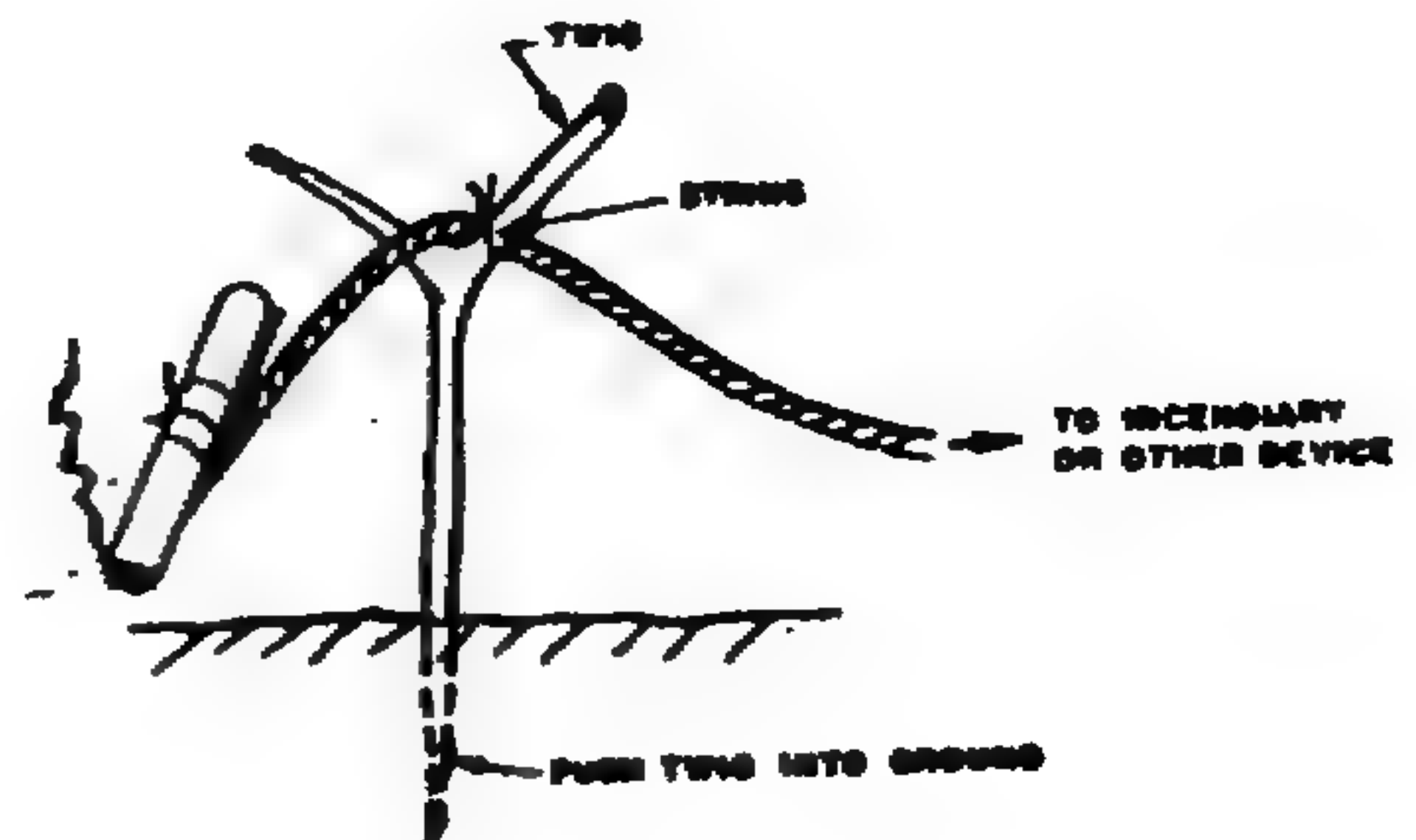
2. Light cigarette in normal fashion. Place a paper match so that the head is over exposed end of fuse cord and tie both to the side of the burning cigarette with string.



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3. Position the burning cigarette with fuse so that it burns freely. A suggested method is to hang the delay on a twig.

NOTE: Common dry cigarettes burn about 1" every 7 or 8 minutes in still air. If the fuse cord is placed 1" from the burning end of the cigarette a time delay of 7-8 minutes will result.



Delay time will vary depending upon type of cigarette, wind, moisture, and other atmospheric conditions.

To obtain accurate delay time, a test run should be made under use conditions.

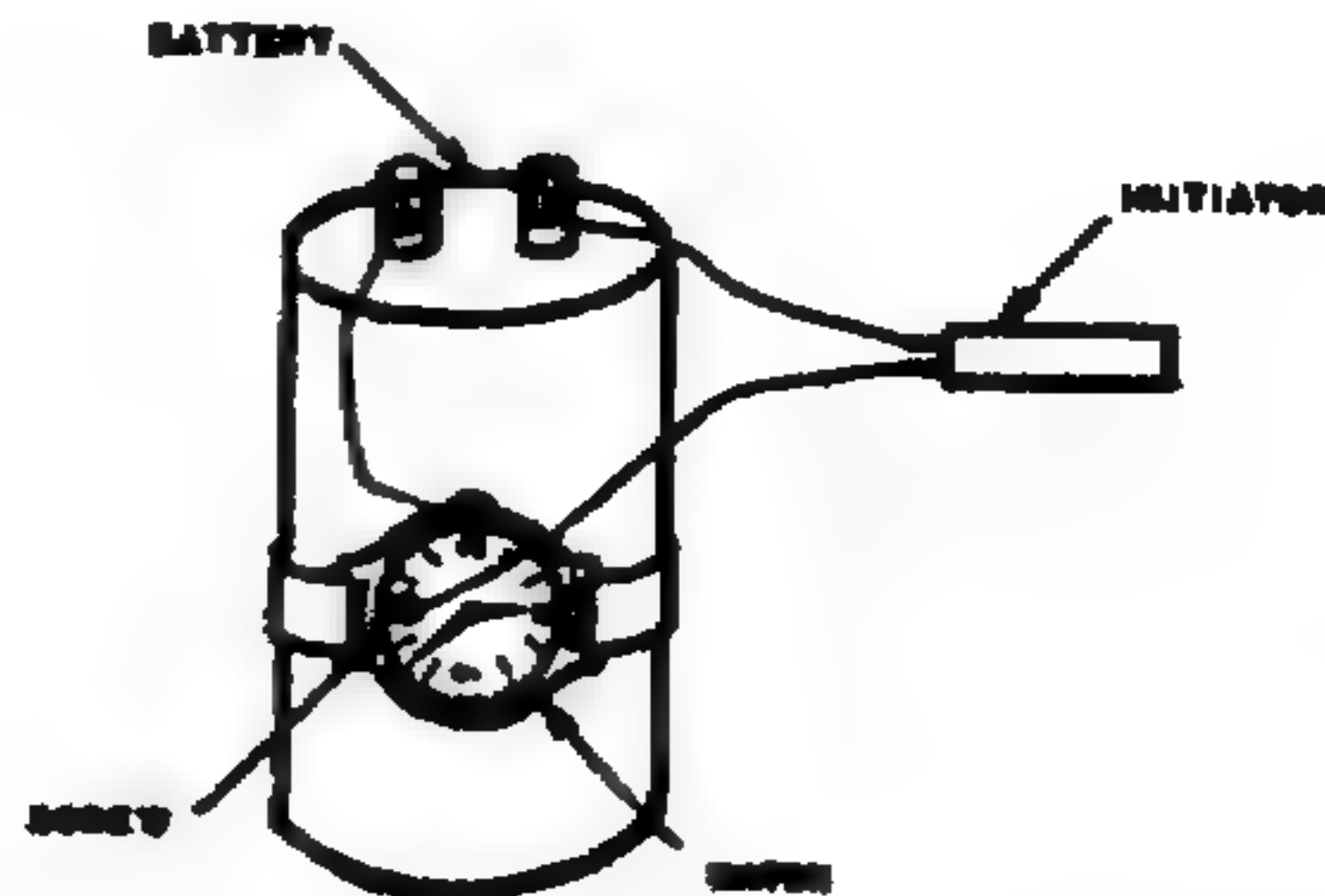
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f. Watch Delay Timer

A time delay device for use with electrical firing circuits can be made by using a watch with a plastic crystal.

Material and equipment required

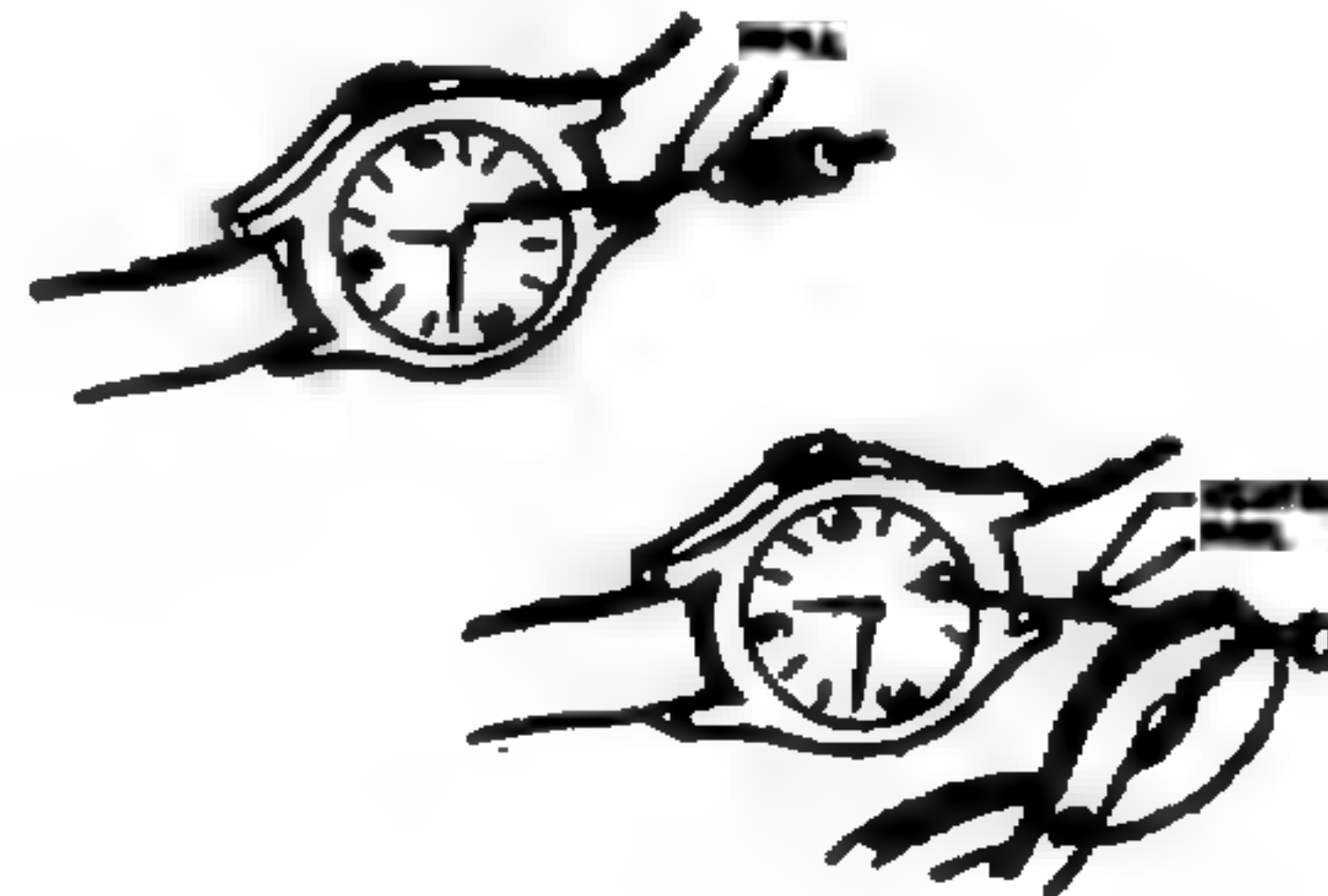
Watch with plastic crystal
Small clean metal screw
Battery
Connecting wires
Drill or nail



Procedure

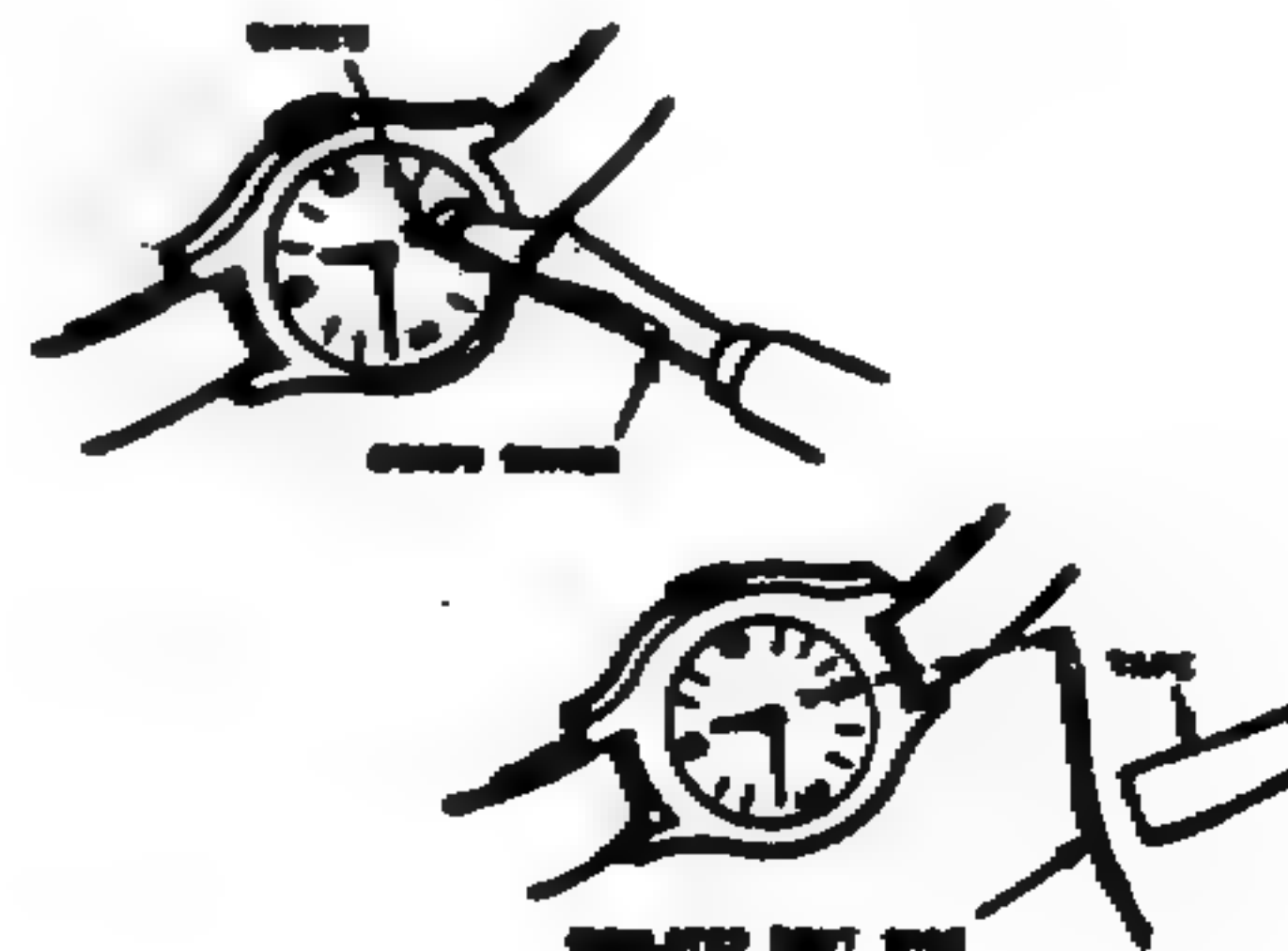
1. If watch has a sweep or large second hand, remove it. If delay time of more than hour is required, also remove the minute hand. If hands are painted, carefully scrape paint from contact edge with knife.

2. Drill a hole through the crystal of the watch or pierce the crystal with a heated nail. The hole must be small enough that the screw can be tightly threaded into it.



3. Place the screw in the hole and turn down as far as possible without making contact with the face of the watch. If screw has a pointed tip, it may be necessary to grind the tip flat.

If no screw is available, pass a bent stiff wire through the hole and caps to crystal.



IMPORTANT: Check to make sure hand of watch cannot pass screw or wire without contacting it.

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How to use

1. Set the watch so that a hand will reach the screw or wire at the time you want the firing circuit completed.
2. Wind the watch
3. Attach a wire from the case of the watch to one terminal of the battery.
4. Attach one wire from an electric initiator (blasting cap, squib or alarm device) to the screw or wire on the face of the watch.
5. After thorough inspection is made to assure that the screw or the wire connected to it is not touching the face or case of the watch, attach the other wire from the initiator to the second terminal of the battery.

CAUTION: Follow step 5 carefully to prevent premature initiation.

Scientific Principles of Improvised Warfare and Home Defense

g. No Fuse Flash Igniter

A simple no-flash fuse igniter can be made from common pipe fittings

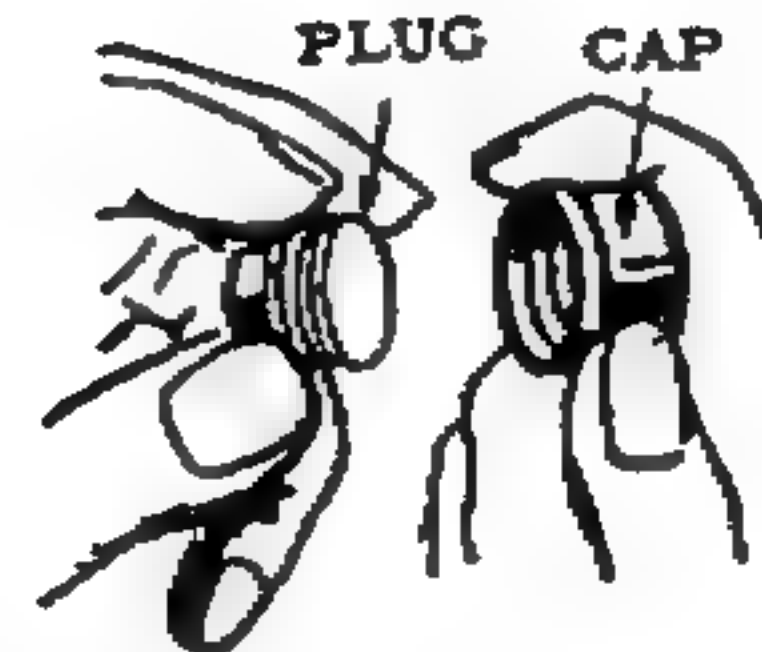
Material Required

1/4" Pipe cap
Solid 1/4" Pipe plug
Flat head nail about 1/16" in diameter
Hand drill
Common "strike anywhere" matches
Adhesive tape

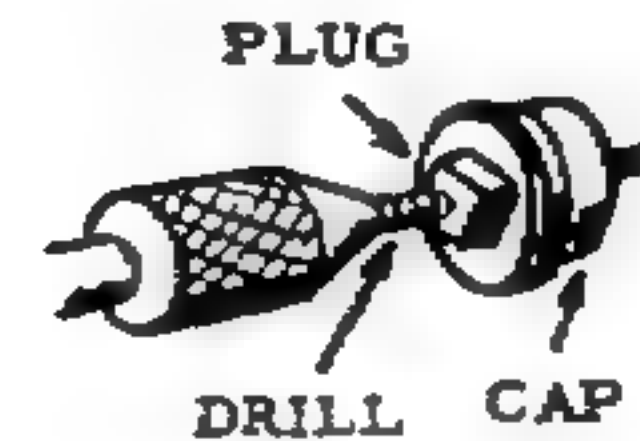


Procedure

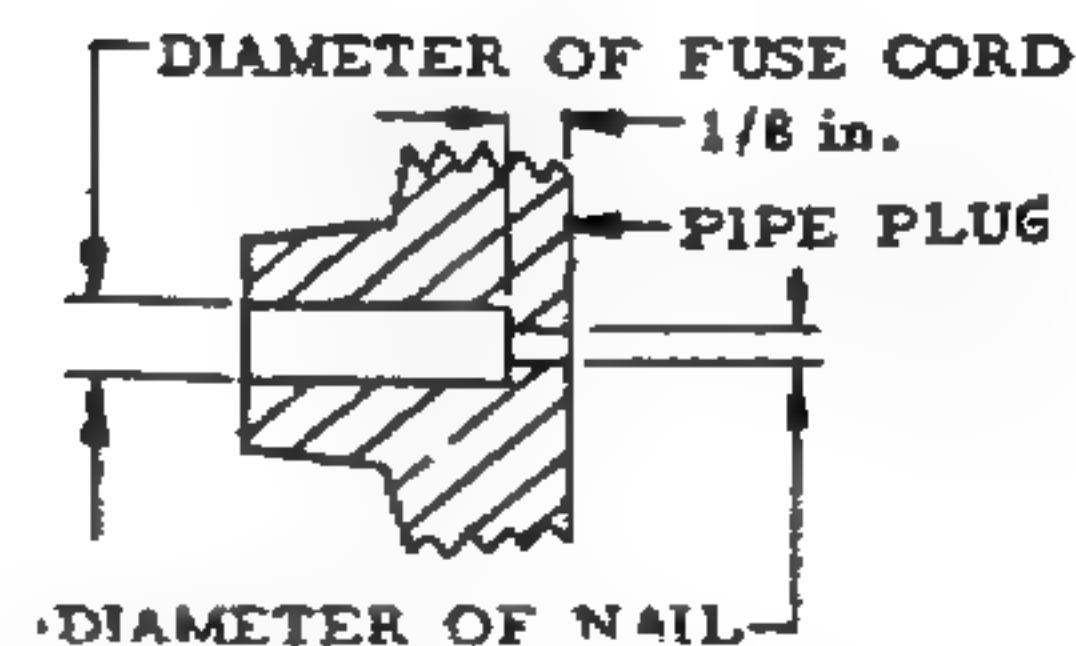
1. Screw the pipe plug tightly into the pipe cap.



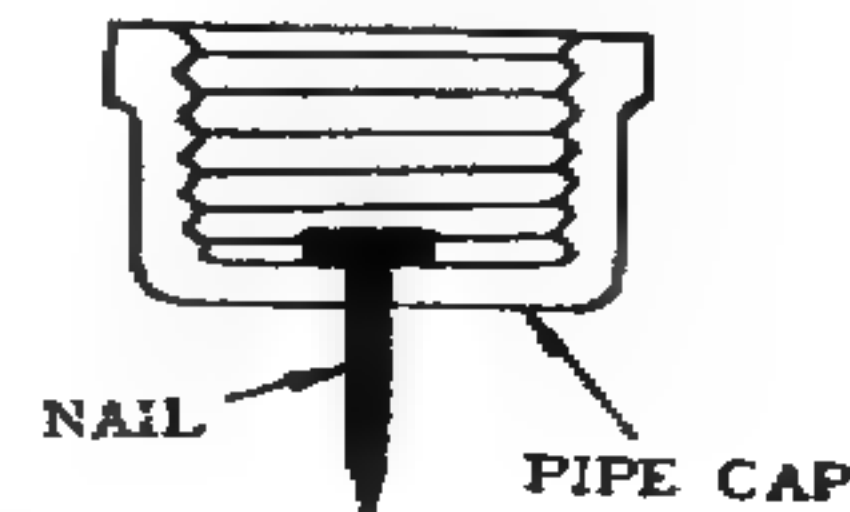
2. Drill hole completely through the center of the plug and cap large enough that the nail fits loosely.



3. Enlarge the hole in the plug except for the last 1/8" so that the fuse cord will just fit.



4. Remove the plug from the cap and push the flat head nail through the hole in the cap from the inside.



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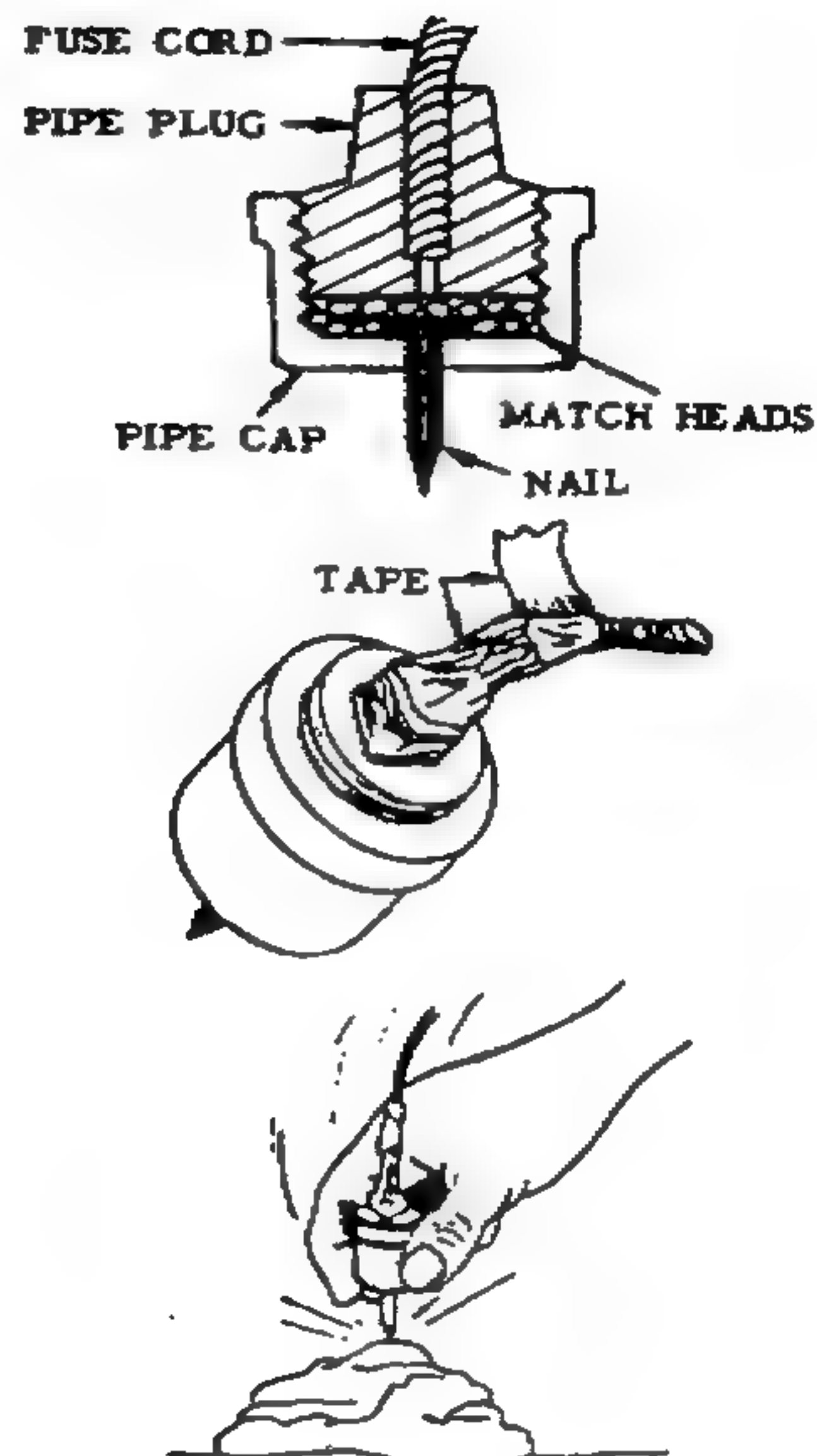
5. Cut the striking tips from app. 10 striking matches. Place match tips inside pipe cap and screw plug in finger tight.

How To Use

1. Slide the fuse cord into the hole in the pipe plug.

2. Tape igniter to fuse cord.

3. Tap point of nail on a hard surface to ignite the fuse.



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h. Dried Seed Timer

A time delay device for electrical firing circuits can be made using the principle of expansion of dried seeds.

Material Required

Dried peas, beans, or other dehydrated seeds
Wide mouth glass jar with non-metal cap
Two screws or bolts
Thin metal plate
Hand drill
Screwdriver

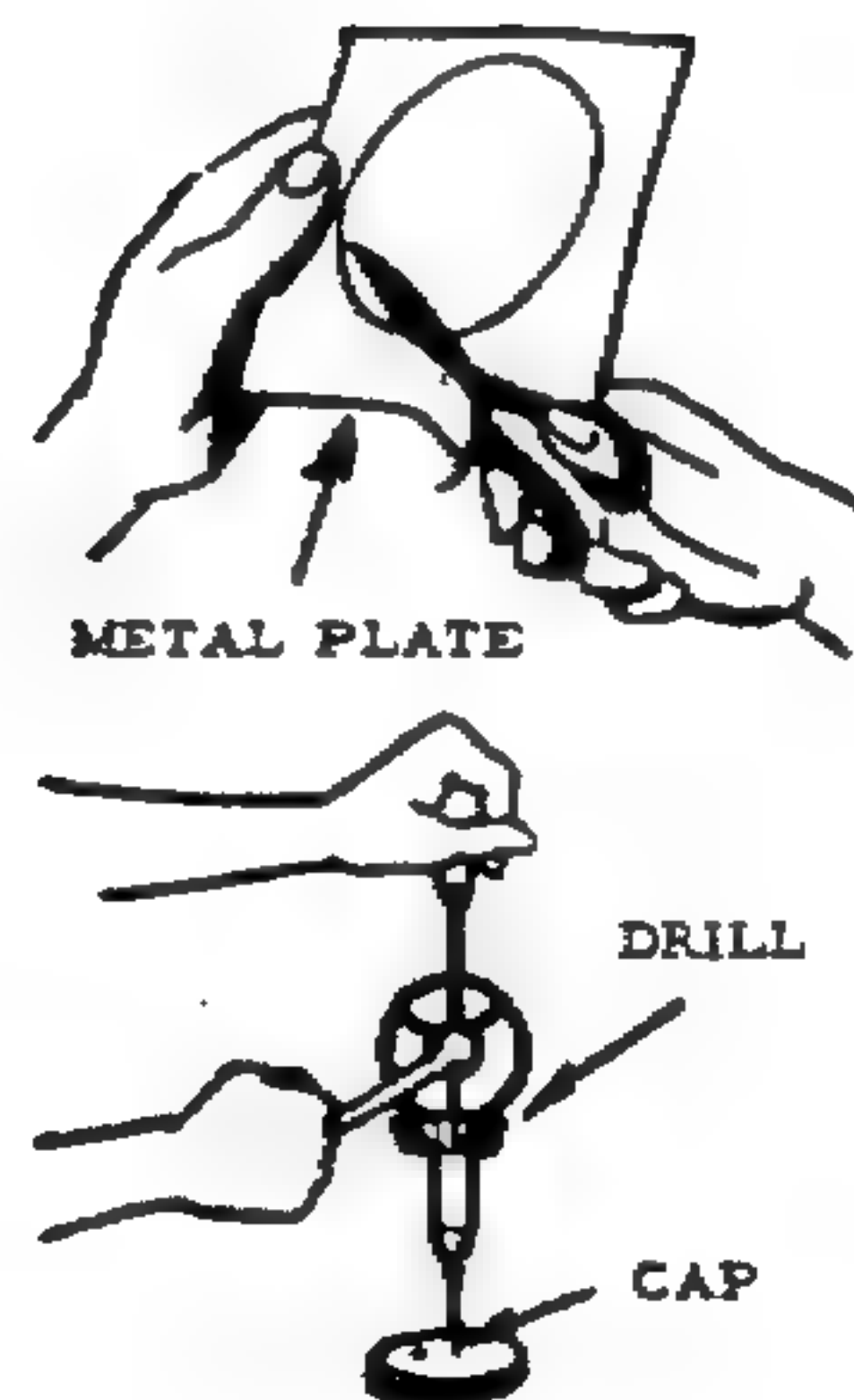


Procedure

1. Determine the rate of rise of the dried beans selected. This is necessary to determine delay time of the timer.
 - a. Place a sample of the dried seeds in the jar and cover with water.
 - b. Measure the time it takes for the seeds to rise a given height. Most dried seeds increase 50% in one to two hours.
2. Cut a disc from thin metal plate. Disc should fit loosely inside the jar.

NOTE: If metal is painted, rusty, or otherwise coated, it must be scraped or sanded to obtain a clean metal surface.

3. Drill two holes in the cap of the jar about 2" apart. Diameter of holes should be such that screw or bolts will thread tightly into them. If the jar has a metal cap or no cap, a piece of wood or plastic (NOT METAL) can be used as a cover.



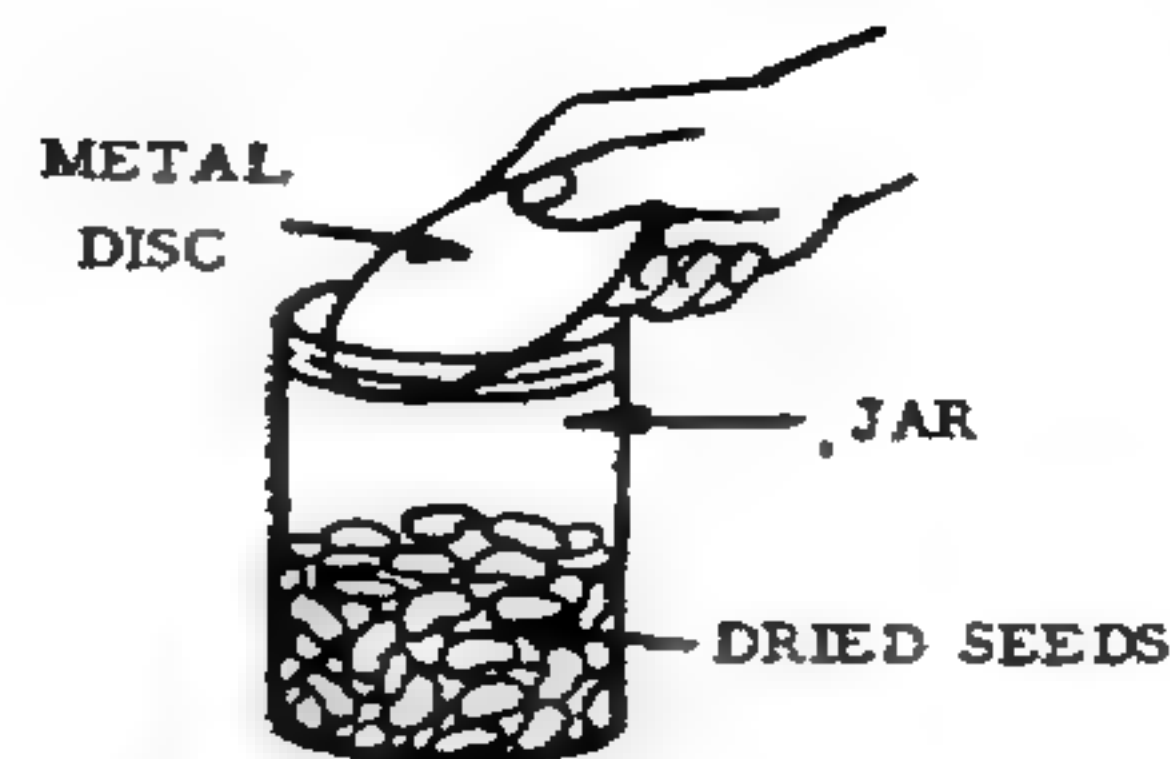
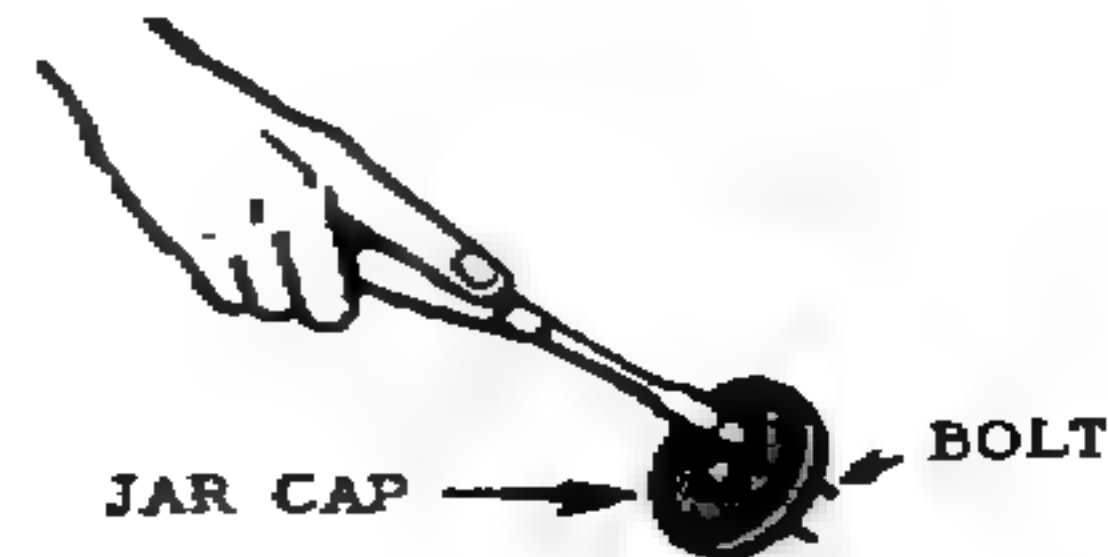
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4. Turn the two screws or bolts through the holes in the cap. Bolts should extend about 1" into the jar.

IMPORTANT: Both bolts must extend the same distance below the container cover.

5. Pour dried seeds into the container. The level will depend upon the previously measured rise time and the desired delay.

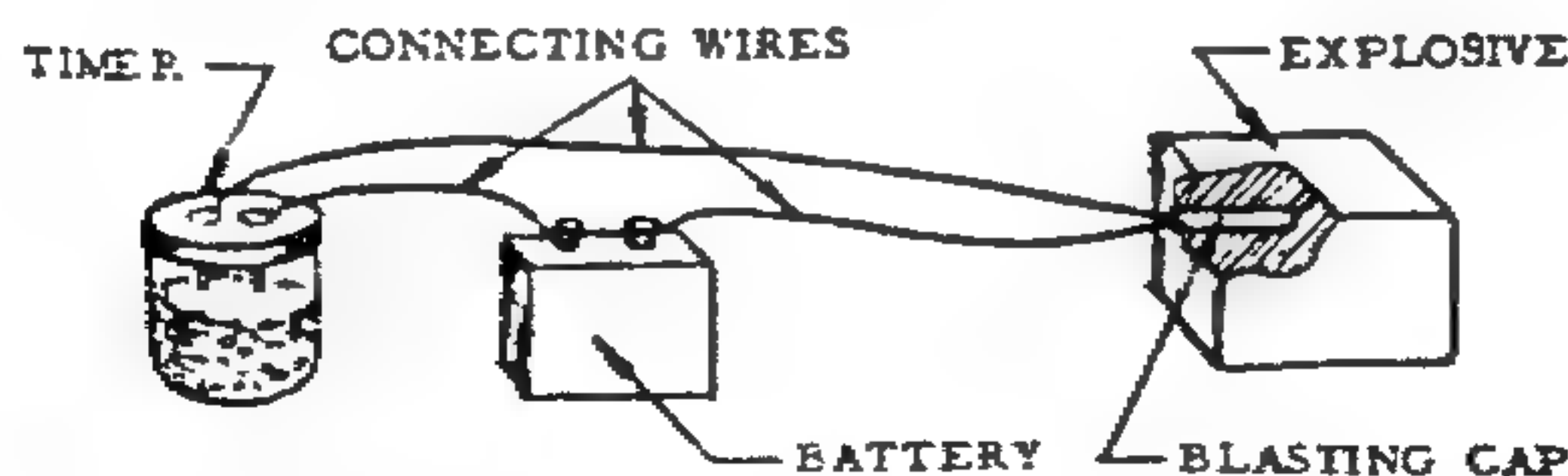
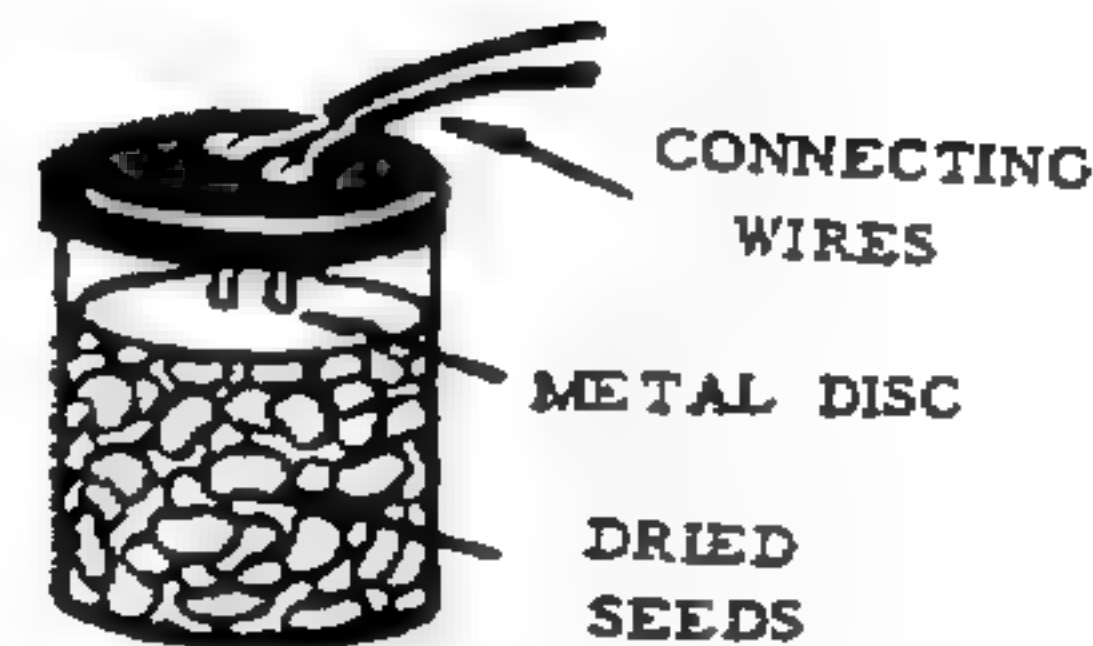
6. Place the metal disc in the jar on top of the seeds.



How to Use

1. Add just enough water to completely cover the seeds and place the cap on the jar.

2. Attach connecting wires from the firing circuit to the two screws on the cap.



Expansion of the seeds will raise the metal disc until it contacts the screws and closes the circuit.

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i. Fuse Cords

These fuse cords are used for igniting propellants and incendiaries or, with a non-electric blasting cap, to detonate explosives.

FAST BURNING FUSE

The burning rate of this fuse is app. 40" per minute

Material Required

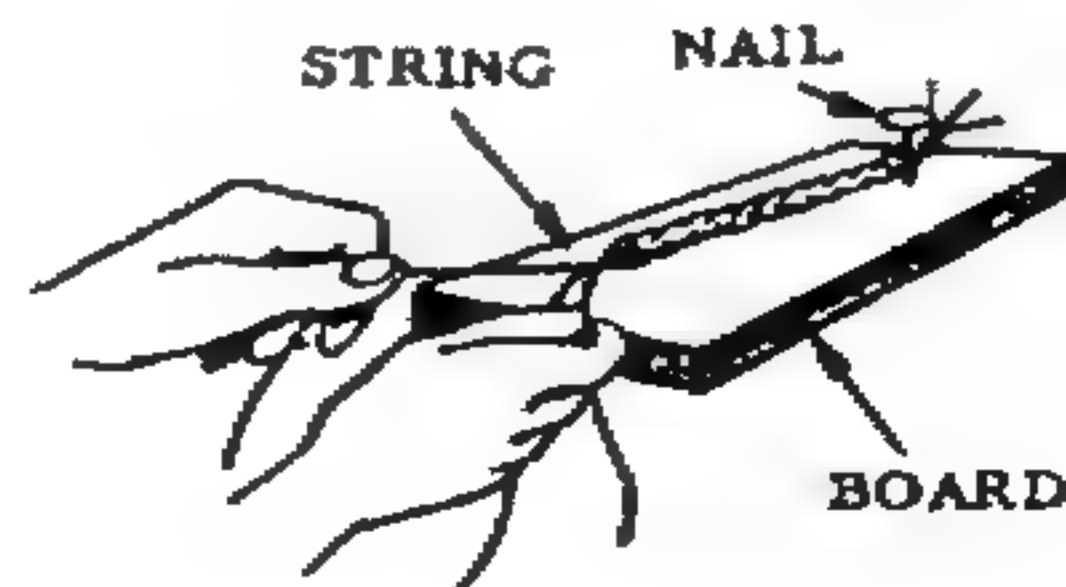
Soft cotton string		(Potassium Nitrate	25 parts
Fine Black Powder	or	(Charcoal	3 parts
Piece of round stick		(Sulfur	
Two pans or dishes			

Procedure

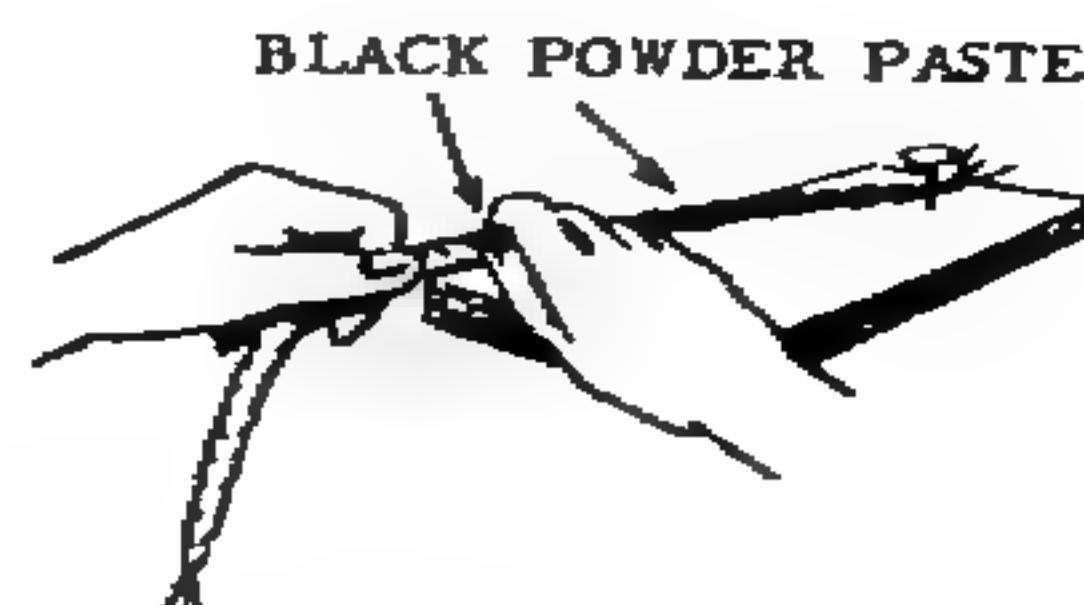
1. Moisten fine black powder to form a paste or prepare a substitute as follows:

- Dissolve Potassium Nitrate in an equal amount of water.
- Pulverize charcoal by spreading thinly on a hard surface and rolling the round stick over it to crush to a fine powder.
- Pulverize sulfur in the same manner.
- Dry mix Sulfur and Charcoal
- Add Potassium Nitrate solution to the dry mix to obtain a thoroughly wet paste

2. Twist or braid three strands of cotton string together.



3. Rub paste mixture into twisted string with fingers and allow to dry.



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4. Check actual burning rate of fuse by measuring the time it takes for a known length to burn. This is used to determine the length needed for a desired delay time. If 5" burns for 6 seconds, 50 inches of fuse cord will be needed to obtain a one minute (60 second) delay time.

SLOW BURNING FUSE

The burning rate of this fuse is app. 2" per minute

Material Required

Cotton string or 3 shoelaces

Potassium Nitrate or Potassium Chlorate

Granulated Sugar

Procedure

1. Wash cotton string or shoelaces in hot soapy water; rinse in fresh water.
2. Dissolve 1 part Potassium Nitrate or Potassium Chlorate and 1 part granulated sugar in 2 parts of hot water.
3. Soak string or shoelaces in solution.
4. Twist or braid three strands of string together and allow to dry.
5. Check actual burning rate of the fuse by measuring the time it takes for a known length to burn. This is used to determine the length needed for the desired delay time. If 2" burns for 1 minute, 10" will be needed to obtain a 5 minute delay.

NOTE: The last few inches of this cord (the end inserted in the material to be ignited) should be coated with the fast burning black powder paste if possible. This **MUST BE DONE** when the fuse is used to ignite a blasting cap.

REMEMBER: The burning rate of either of these fuses can vary greatly. **DO NOT USE** for ignition until you have checked their burning rate.

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k. Clothespin Time Delay Switch

A 3-5 minute time delay switch can be made from a clothespin switch and a cigarette. The system can be used for initiation of explosive charges, mines and booby traps.

Material Required

Spring type clothespin

Solid or stranded copper wire about 1/16" in diameter (field or bell wire is suitable)

Fine string, about 6" in length

Cigarette

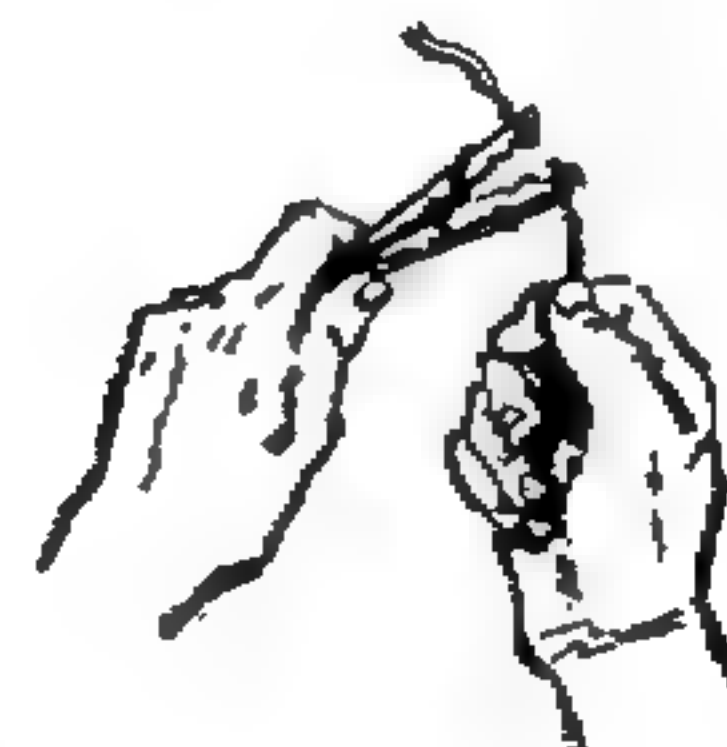
Knife

Procedure

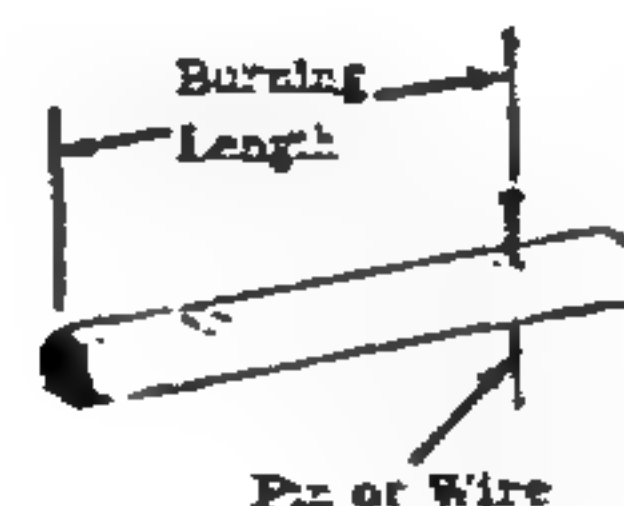
1. Strip about 4" of insulation from the ends of 2 copper wires. Scrape copper wires with pocket knife until metal is shiny.



2. Wind one scraped wire tightly on one jaw of the clothespin, and the other wire on the other jaw so that the wires will be in contact with each other when the jaws are closed.



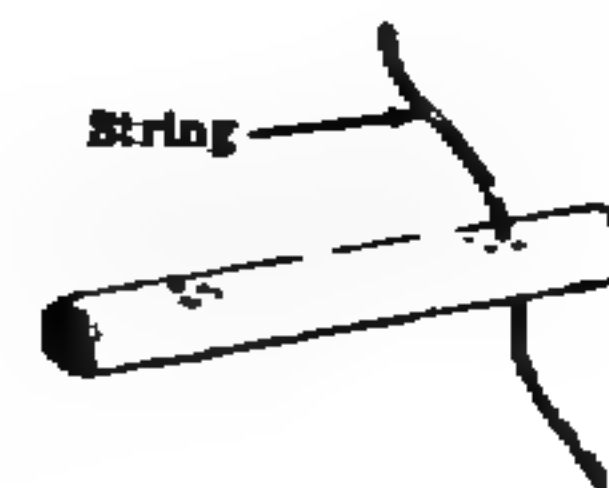
3. Measuring from tip of cigarette, measure a length of cigarette that will correspond to the delay time desired. Make a hole in cigarette at this point, using wire or pin.



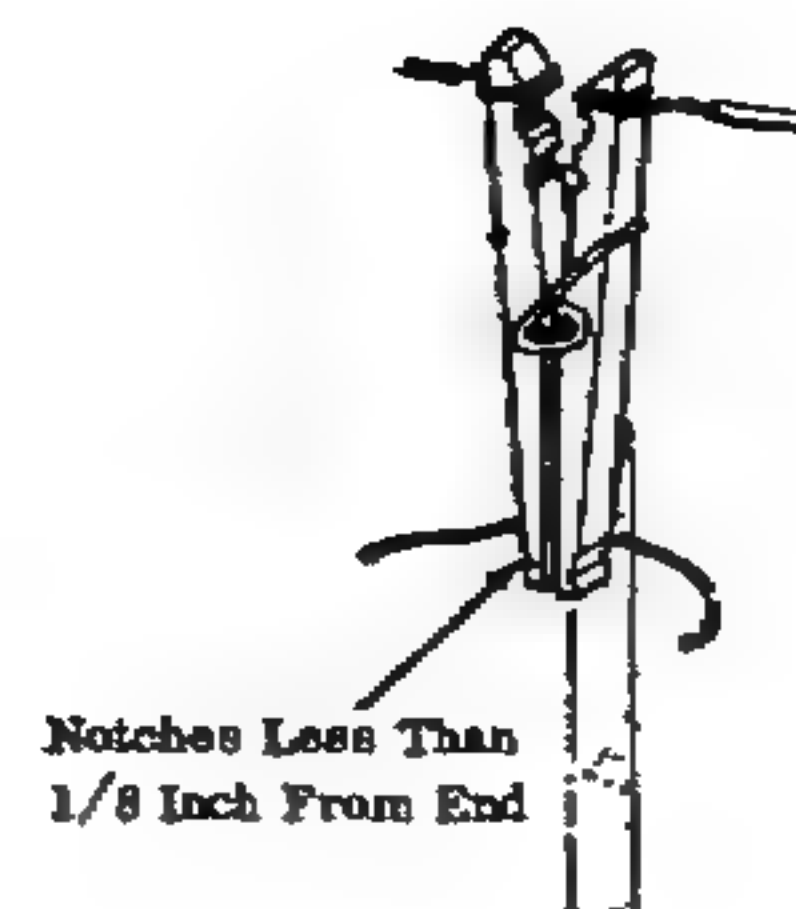
NOTE: Delay time may be adjusted by varying the burning length of the cigarette. Burning rate in still air is app. 7 minutes per inch. Since this rate varies with environment and brand of cigarette it should be tested in each case if accurate delay time is desired.

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4. Thread string through hole in cigarette.



5. Tie string around rear of clothespin, 1/8" or less from end. The clothespin may be notched to hold string in place.

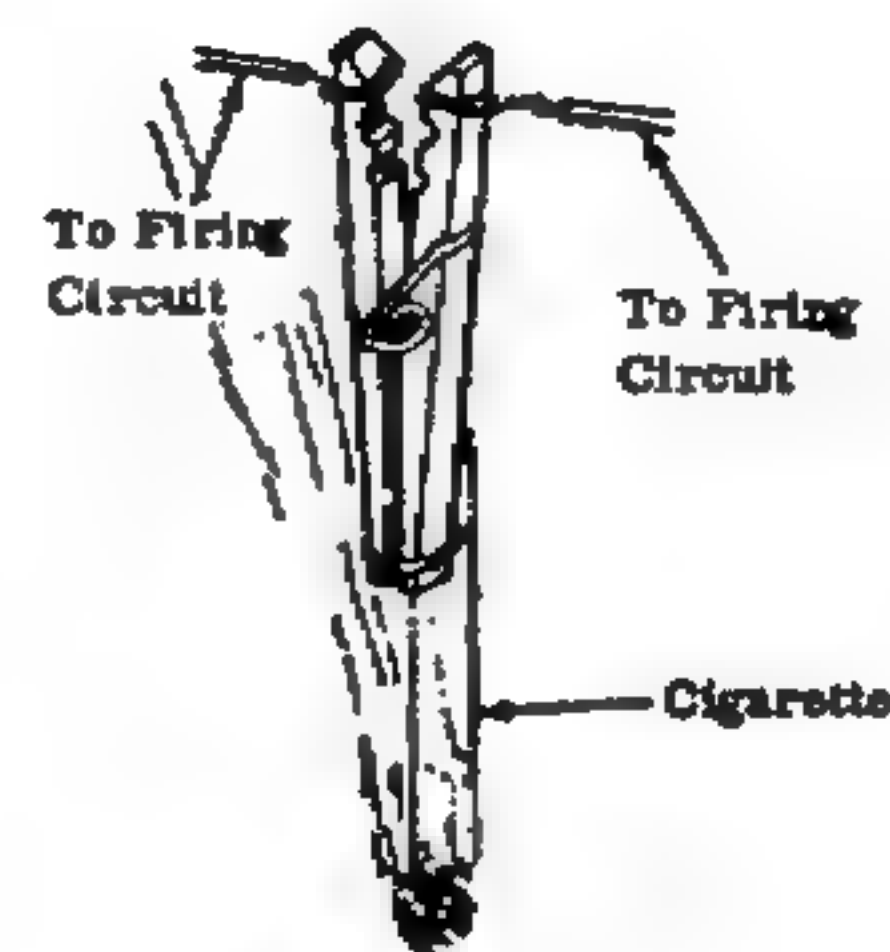


NOTE: The string must keep the rear end of the clothespin closed so that the jaws stay open and no contact is made between the wires.

How to Use

Suspend the entire system vertically with the cigarette tip down. Light tip of cigarette. Switch will close and initiation will occur when the cigarette burns up to and through the string.

NOTE: Wires to the firing circuit must not be pulled taut when the switch is mounted. This could prevent the jaws from closing.



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1. Time Delay Grenade

This delay mechanism makes it possible to use an ordinary grenade as a time bomb

Material Required

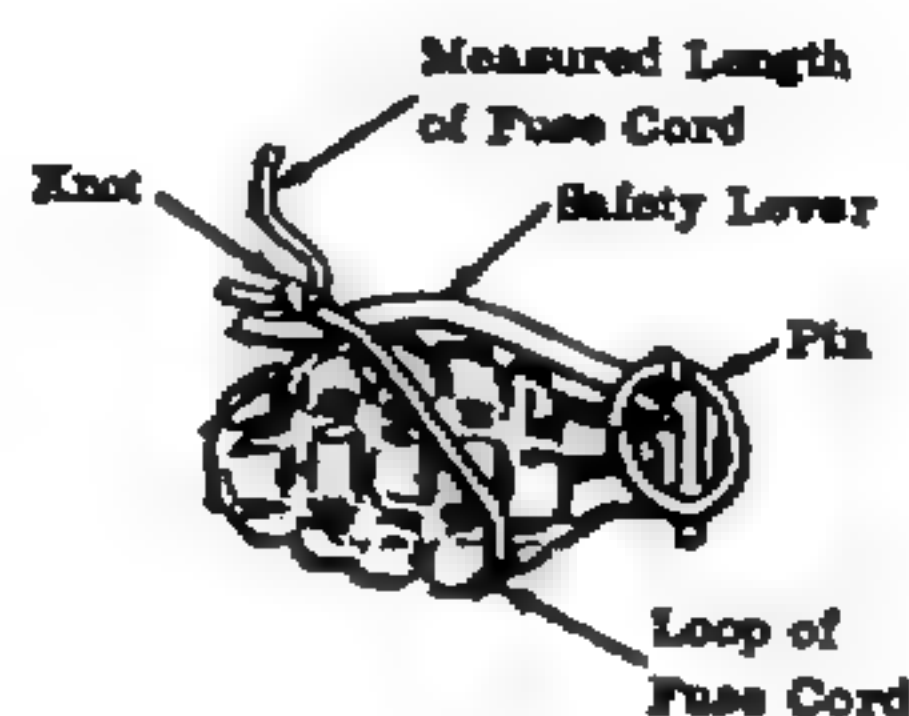
Grenade

Fuse Cord

IMPORTANT: Fuse cord must be the type that burns completely. Slow burning improvised fuse cord is suitable. Safety fuse is NOT satisfactory, since its outer covering does not burn.

Procedure

1. Bend end of safety lever upward to form a hook. Make a single loop of fuse cord around the center of the grenade body and safety lever. Tie a knot of the non-slip variety at the safety lever.



NOTE: The loop must be tight enough to hold the safety lever in position when the pin is removed.

2. Measuring from the knot along the free length of the fuse cord, measure off a length of fuse cord that will give the desired delay time. Cut off the excess fuse cord.

How to Use

1. Place hand around grenade and safety lever as safety lever is held in place. Carefully remove pin.



2. Place grenade in desired location while holding grenade and safety lever.

3. Very carefully remove hand from grenade and safety lever, making sure that the fuse cord holds the safety lever in place.

CAUTION: If loop and knot of fuse cord do not hold for any reason and the safety lever is released, the grenade will explode after the regular time delay.

4. Light free end of fuse cord.

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m. Detonator

Detonators (blasting caps) can be made from a used small arms cartridge case and field manufactured explosives. Detonators are used to initiate secondary high explosives.

Material Required

Primary explosive

Booster explosive

Improvised scale

Used cartridge case

Fuse, 12" long

Round wooden stick (small enough to just fit in the neck of the cartridge case)

Drill or knife

Long nail with sharpened end

Vise

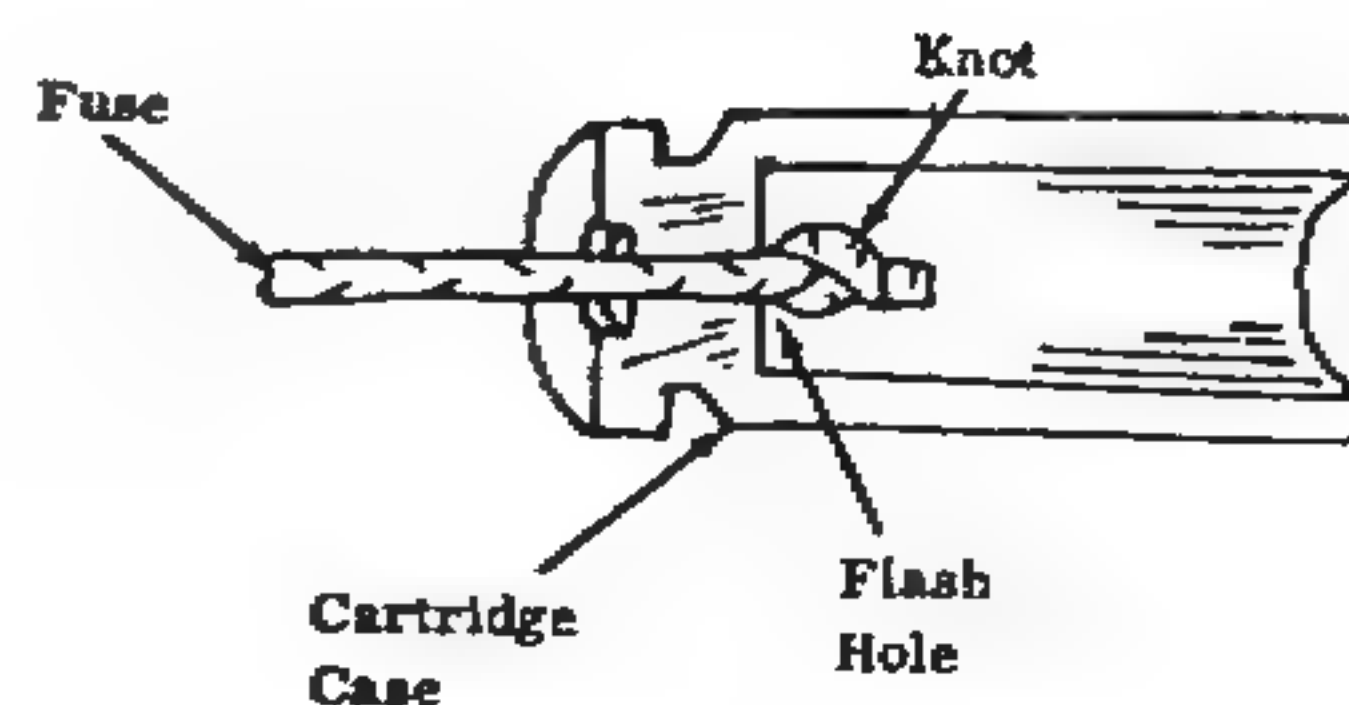
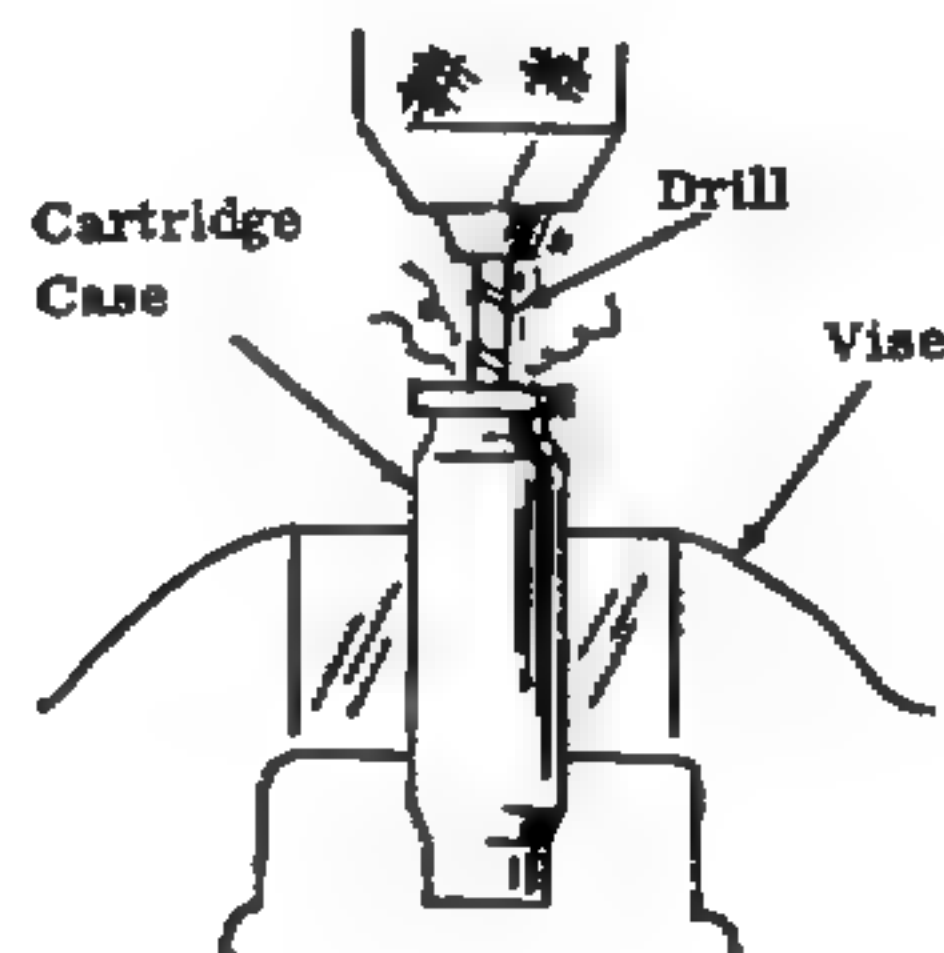
Improvised loading fixture

Procedure

1. Remove fired primer from a used cartridge case using a sharpened nail.

2. If necessary, open the flash hole in the primer pocket using a drill or knife. Make it large enough to receive fuse.

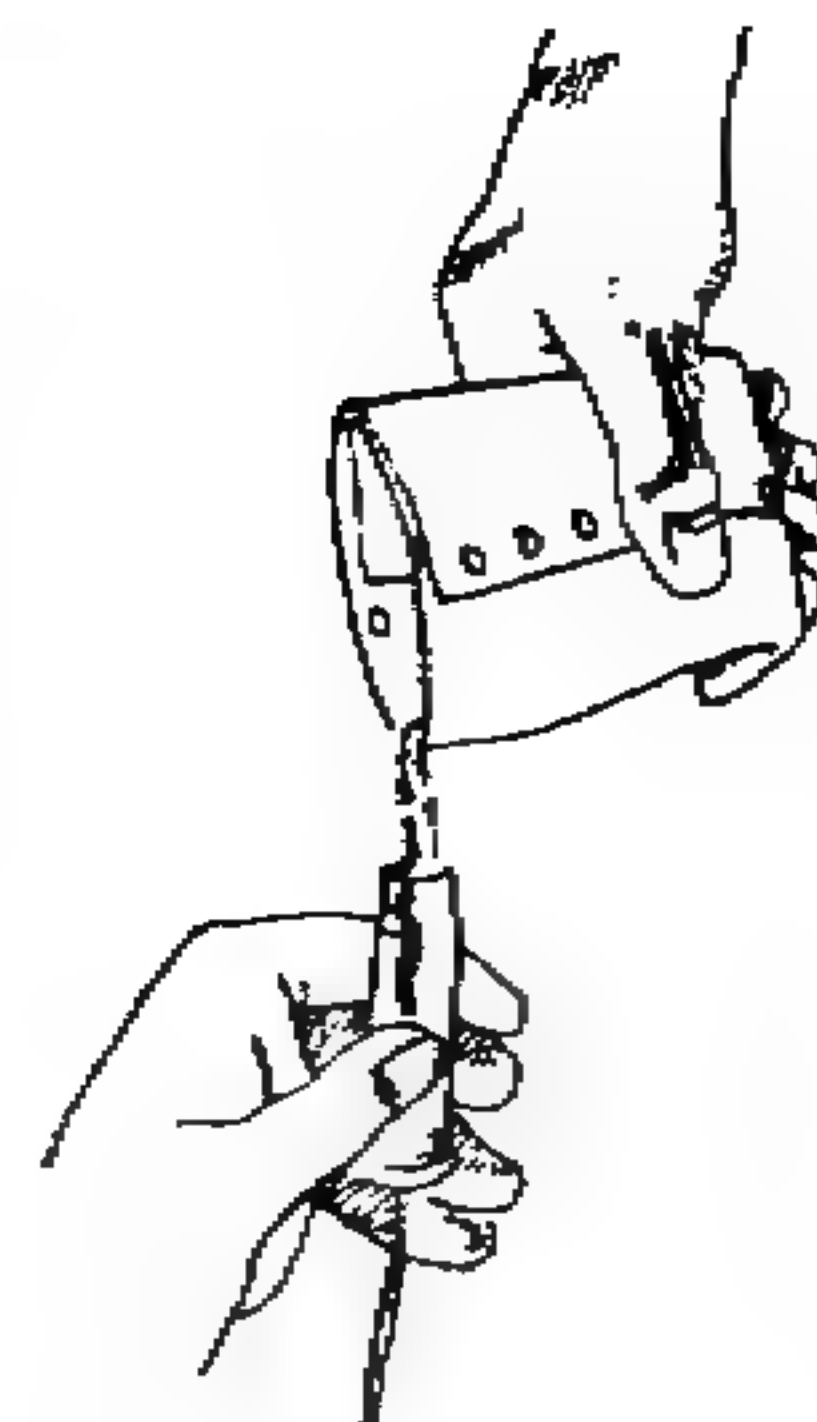
3. Place one end of the fuse in the flash hole and extend it through the case until it becomes exposed at the open end. Knot this end and then pull fuse in cartridge case thus preventing fuse from falling out.



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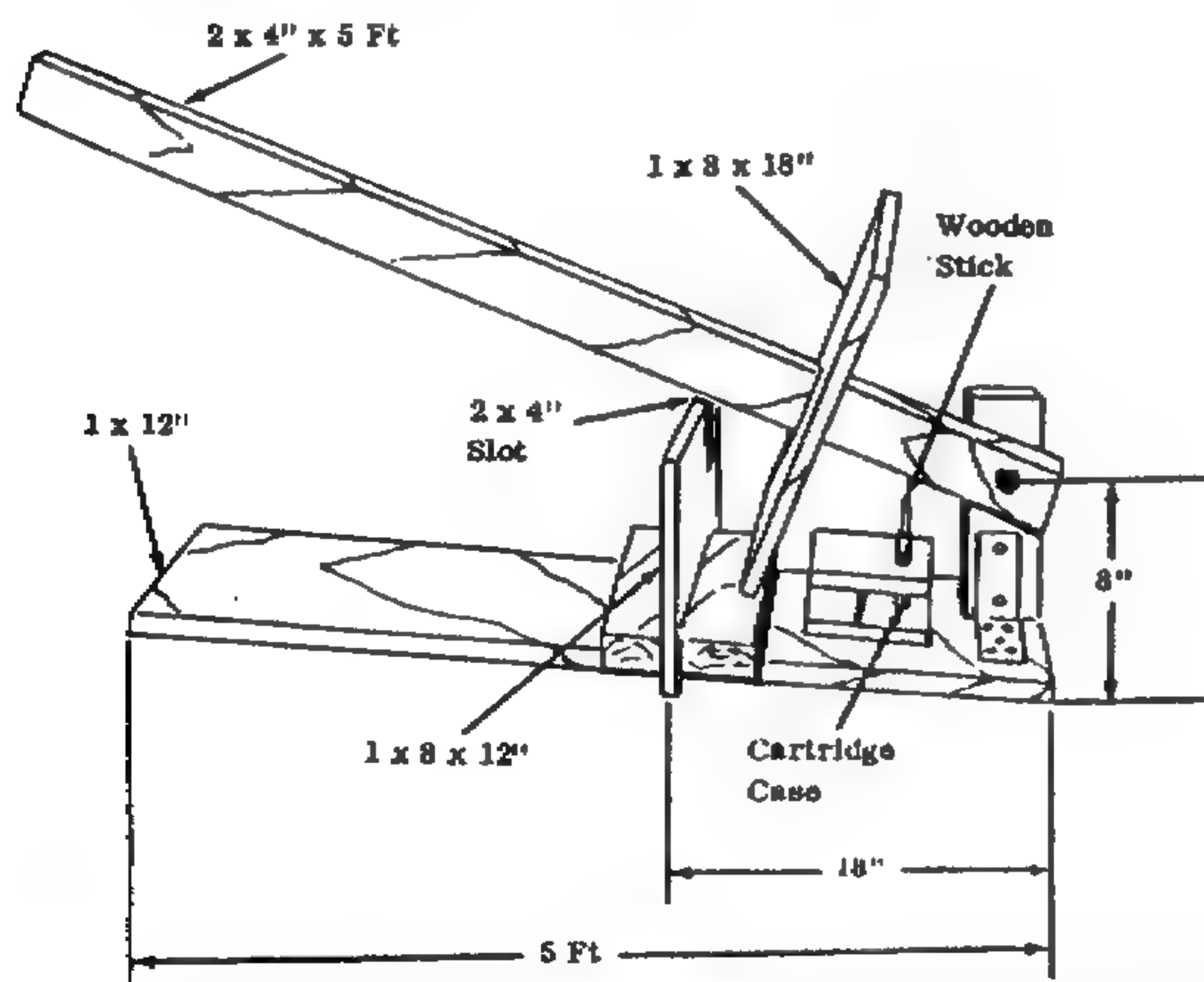
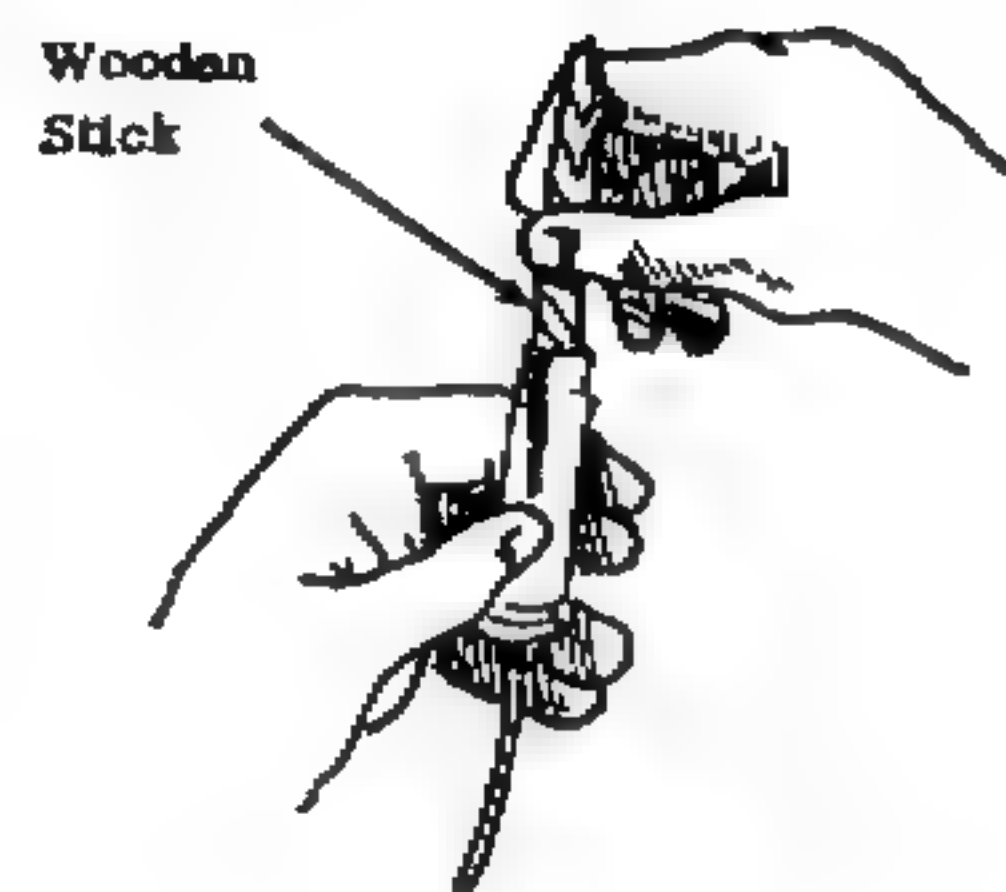
4. Load the primary explosive in the cartridge case as follows

Lead Picrate	3 grams
TACC (Tetramminecopper Chlorate)	1 gram
DDNP	.5 gram
Mercury Fulminate	.75 gram
HMTD	.75 gram
Double Salts	.75 gram



5. Compress the primary explosive into the cartridge case with the wooden stick and the following improvised loading fixture.

CAUTION: The primary explosive is shock and flame sensitive.



6. Add one gram of booster explosive. The booster can be RDX.

7. Compress the booster explosive into the cartridge case with wooden stick and the loading fixture.

8. If the case is not full, fill the remainder with the secondary explosive to be detonated.

CAUTION: Detonator has considerably more power than a military blasting cap and should be handled carefully.

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n. Can-Liquid Time Delay

A time delay device for electrical firing circuits can be made using a can and liquid.

Material Required

Can

Liquid (water, gasoline, etc.)

Small lock of wood or any material that will float on the liquid

Knife

2 pieces of solid wire, each piece 1 foot or longer

Procedure

1. Make 2 small holes at opposite sides of the can very close to the top.



2. Remove insulation from a long piece of wire for a distance a little greater than the diameter of the can.



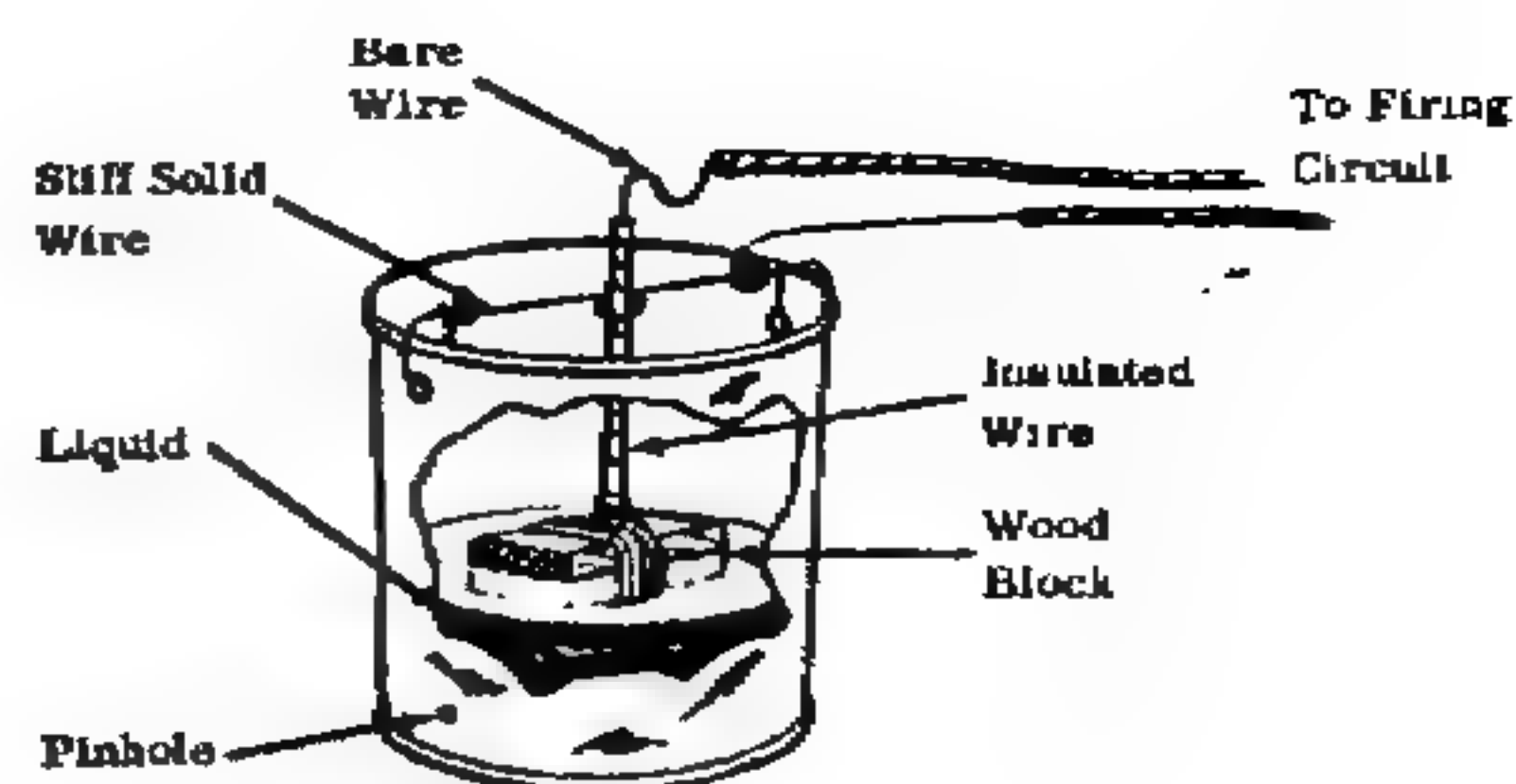
3. Secure the wire in place across the top of the can by threading it through the holes and twisting in place, leaving some slack. Make loop in center of wire. Be sure a long piece of wire extends from the end of the can.



4. Wrap a piece of insulated wire around the block of wood. Scrape insulation from a small section of this wire and bend as shown so that wire contacts loop before wood touches bottom of container. Thread this wire through the loop of bare wire.

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5. Make a very small pinhole in the side of the container. Fill container with a quantity of liquid corresponding to the desired delay time. Since the rate at which liquid leaves the can depends on weather conditions, liquid used, size of hole, amount of liquid in the container, etc., determine the delay time for each individual case. Delays from a few minutes to many hours are possible. Vary time by adjusting liquid level, type of liquid (water, oil) and hole size.



How To Use

1. Fill can with liquid to the same level as during experimental run. Be sure that wooden block floats on liquid and that wire is free to move down as liquid leaves the container.

2. Connect wires to firing circuit.

NOTE: A long term delay can be obtained by placing a volatile liquid (gasoline, ether, etc.) in the can instead of water and relying on evaporation to lower the level. Be sure that the wood will float on the liquid used. **DO NOT MAKE PINHOLE IN SIDE OF CAN.**

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Chapter 11 Combat Support, Skills, and Equipment

When a decision is made to wage war, soldiers , and the involved civilians need to have certain skills organized toward the work of warmaking and need to be trained to be able to support the warmaking effort. These non combat skills are essential if populations are to survive and resist the disease, injuries, famine, and social upheaval that war brings. Early examples in the 1990's include Bosnia, the Kurds in northern Iraq, the many outbreaks of civil war in the various African nations, and all the other countries where freedoms are only practiced as a pretense.

Essential and basic skills include

1. Organization: There must be a clear chain of command to decide what work is to be done and who will do it.
2. Industry: It is important that the repetitive work of weapons and ordnance construction and other essential warmaking supplies be efficiently and correctly produced by trained personnel.
3. Intelligence: Must be gathered, disseminated, and acted upon.
4. Communications and Electronic Warfare: Must be conducted in a secure manner.
5. Survival and Evasion of troops and civilians: is essential to maintain power and hope when faced with death or starvation.
6. Leadership: must be effective to maintain morale and deal with refugees and the awful living conditions that war often brings to civilians.

1. Organization

When war conditions fall upon a group of people or nation it is critical to put one individual in effective charge of all activities to provide for the war effort. People must be organized to

Create and train an effective fighting force

Support this force through production of key armaments

Supply this force with food, water, transportation, weapons, and ordnance

Give clear direction to civilians who may otherwise waste their efforts in worry and complaining. They can be used to support and aid each other (generating hope)

Establish a police force with a clear purpose of maintaining order and protecting services

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Much of the work involves organizing and motivating civilians to be able to survive and resist where possible. This may be easy where fear is a strong motivator. The problems come when panic sets in while being attacked and possibly being overrun. If people cannot be orderly evacuated then they must be able to go on living under an enemy while being trained and aided in invisible resistance methods. In order to do this and find the right people, the population must be scoured to find people with:

Military Experience, as leaders or specialists in these essential areas

Industry managers and experts who know how to organize production and supply

Teachers who can teach the essential skills to civilians in resistance and aiding each other

Survival experts, ranging from gardeners who know what plants can be grown or are safe to eat and farmers who may be needed to share their skills to keep the population fed, and others to teach sanitation, personal protection and movement.

Electronics experts for intercepting enemy communications and conducting ECM/ESM

Police and medical experts for crowd and traffic control and teaching the civilians how to aid their wounded and maintain health and sanitation.

Leadership for maintaining hope and clear direction and purpose. This purpose has to be positive and recognized as good for all the people. It cannot be a simple power grab or people will quickly recognize this and rarely support it. Centering efforts on the good things the people can be and what they can do for each other and most importantly, how they can succeed will aid in resisting the enemy.

The work needs to be organized according to the threat. If the threat is armed ground invasion, then the work needs to be organized around stopping the ground assault and evacuation of key equipment and personnel if it becomes necessary. These steps include

Digging ditches and traps and equipping them accordingly. This involves sighting the best locations to stop enemy traffic flow or funneling it to killing zones. The ditches can buy a great deal of time and when combined with obstacles may even deter the enemies approach. All the earth moving equipment must be applied to this effort. Many individuals with shovels can also produce considerable barriers overnight.

Equipping a group to lay mines and other ordnance in the expected path of the enemy is critical in stopping the dangerous armored vehicles and any equipment they would bring forward to fill in or bridge your obstacles and ditches.

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The military personnel must be organized and focused to produce localized force advantages of 3:1 or greater if it attacks the enemy in meeting engagements or the enemy attempts to attack their own positions. In defense, ditches and camouflaged positions are critical to allow the forces to fire at the enemy from cover without being seen. These positions can be prepared and hardened in advance with steel or concrete covered with dirt.

The civilians can be trained to provide direct military assistance and resistance if they are capable. If the situation is genuinely hopeless, they can be instructed on how to resist with homemade ordnance, video equipment, radios and so on from behind enemy lines.

If evacuation is decided upon, decisions must be made as to who is evacuated, in what order and to where are they going. Masses of civilians cannot be moved easily and risk causing starvation, spreading disease, and hindering any overall resistance effort. Any movement must be protected in order to maintain order and hope of actually reaching a safer location.

If the main threat is air attack or simply being cut off and starved, the work needs to be organized to build the essential rockets, missiles, anti-aircraft guns, protecting civilians from bombing and strafing, and how to produce their own gardens and food to prevent starvation and feed and supply the forces at the front.

Such essentials as burying human waste to provide fertilizer, or using it for ordnance needs to be taught and organized as it is likely that the sanitation facilities will be early targets and the accumulation of garbage and wastes can be a huge health hazard. They don't have to be when they can be turned into fuel for fires, fertilizer, and even ordnance and biological weapons. Untreated wastes should not be discharged directly into streams and rivers unless the enemy is living downstream.

If you are conducting offensive operations from commando raids to actual large scale armed assaults you need essential combat support groups, organized and equipped. These include

Engineers with special training to overcome and bridge the enemies obstacles with bridging equipment and mine clearing abilities. Obstacle and camouflage construction.

Communications specialists to make sure that all forces and command can be coordinated

Transportation troops to keep the supplies and offensive moving at high speed

Military Police to maintain order and protect the government from some of its own people

Intelligence including maps, video, electronic and interrogation information.

Utilities engineers to provide portable electric power, restrooms, baths, decontamination, bakeries and other essential plants.

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Medical personnel who are trained to give first aid and evacuate troops and conduct preventive medicine to keep the troops in combat shape.

Maintenance experts who can keep utilities and vehicles going. Preventive maintenance is taught by this group.

Headquarters with the communications to all support and combat troops, with intelligence personnel and analysts to support the leaders. The direction and ability to function and coordinate work between all units is critical to success.

2 Industry

Everything combat troops need in the field must be produced or field improvised. Factories can likewise be field improvised. Ammunition can be obtained for guns almost anywhere in the world. As the Bosnian populations quickly discovered, when the rest of the world stops selling the basics you either learn to smuggle what you need, improvise everything, or simply die when the enemy comes for you.

Mini factories can be established for the key components of warmaking in individuals homes. The work can individually be taught and supplies flow worked out as follows.

- | | |
|-------------|--|
| Explosives- | Potassium Nitrate production from mixed waste and dirt sites
Sulfur mining or importing
Charcoal production from wood
Nitric Acid production from the Potassium Nitrate and Sulfuric Acid
All final formula explosives desired from the above raw materials
Chemicals and Biological plants |
| Ordnance- | Mines, grenades, and booby traps
Bullets
Shells
Rockets and Missiles
Demolition
Chemicals and Biologicals |
| Equipment- | Firearms
Rocket and shell launchers
Rocket and missile tube assemblies
Artillery guns (If barrel casting and ammo know how is available)
Mines, grenades, and booby trap parts
Hand held weapons |

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The information flow needs to be from the raw material supplier to the fabricator of the parts to the final user who must be trained in how to reliably use the weapons. As long as raw materials can be obtained, the entire population could be organized in specialty areas to produce war materials. In addition, each home could effectively be provided with defensive weapons including the mines, booby traps, one shot firearms if regular guns are not available (with a lot of pipe and reloading, every family dwelling and group could put up tremendous resistance even with the simple one shot guns described in this book).

It is important to organize the work into parts where individuals become familiar and eventually expert with what they are making and how to use it. This makes the devices and chemicals reach a high standard of reliability for the troops to have confidence in.

Factories for the specialized production of obstacles such as barbed wire and trenching tools is an important part of a defensive campaign. Having specialists manufacture camouflage and armored bunker sites to shoot from is critical in defense. Where possible, personal armor for the troops must be provided in the form of helmets, flak jackets and body shields.

For unemployed civilians, the accumulation of rubble to cover roads and act as speed bumps against an enemy advance can be an aid and give the feeling of helping the war effort. Offering to feed the laborers as opposed to handing out welfare is suggested.

All of these plans, if carried out can turn an entire civilian population into a trained army of thousands or millions. Instead of having cities of fat sheep or cattle for the simple taking by an enemy, the entire population can be turned into a hornets nest of resistance. If every single approach to a dwelling results in casualties from mines, booby traps, gunfire, incendiaries, and requires the painstaking and time consuming acts of filling in or bridging ditches just to reach the front door, it is likely that the enemy's soldiers will become discouraged. This is especially true if many of their armored vehicles and tanks are lost in the effort.

The recent example of Saddam Hussein invading and retaking the US "protected" areas of northern Iraq provides a good case study. Instead of relying on the "cheap talk" of the allies, the Kurdish population, had they some idea of what to actually do, could have produced their own armaments and obstacles and could have offered tremendous resistance to the 30,000 invading Iraqi army troops. If you arm several hundred thousand civilians with the know how and materials for guns, mines, and the other capabilities described in this book, it would have taken a lot more than two divisions and a couple of days to overrun any of their cities. The same would have been true for the populations in Bosnia and the different African nations where the ethnic differences between the army and civilians resulted in massacres.

Organizing a defense takes time and know how. Common sense is an often used phrase but it is not much help. Common sense only comes from experience obtained on the job or through training. You can have no "common sense" for anything unless you have the know how and experience in the particular field. Without the know how that this book teaches, civilian populations are fat sheep and cattle being led to the slaughter in many parts of the world.

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When faced with a real shooting war, the know how taught in this book must be translated to a real organization and arming of the civilian population to aid the war effort. The factories must then come on line to supply and support this effort and provide the focus and hope that the population must have in order to keep fighting and eventually win.

One final and important decision in the choice of what factories to build are the political ones. Many leaders might be squeamish about using biological or chemical weapons. The obvious answer is that if this choice is scary to you it will be mortifying to the enemy trying to kill you. When the wolf comes to your door to kill you, you have a right to use **anything** your mind can conceive of to protect yourself. Let the most dangerous chemical and bio weapons you can make be part of the factory plan. Use them defensively in anti tank and personnel mines, booby traps, and ditches. When the enemy forces himself on you and encounters them, its his own fault for trying to invade your homes.

Factories must also be equipped to manufacture the needed items. Using 55 gallon drums in place of pots or pans and cement mixers in place of mixing bowls are obvious. Simple shop tools can be supplied to fabricate components in most cases. The larger scale machines may have to be pooled among the home factories to meet everyone's needs.

3. Intelligence

There are many kinds of intelligence that can be gathered and used. We will cover these one at a time.

Strategic: involves learning everything about the enemy and what they are capable of. This includes collection of maps, home videos, news reports, satellites (including the weather channel), newspapers and other publications of the enemy country, use of spies for obtaining the above and other information and interrogation of POW's. This information must be collected and disseminated to the leaders who must use it.

Tactical: or operational involves details of the areas of concern such as a country or localized front. It is broken down into activities such as troop movements, air operations, naval operations, economic activity, and political activities. These must be studied on an ongoing basis to provide early warning of an enemies approach or intentions. If you know where and about when he is going to strike, you then know where to position defensive ordnance, obstacles and troops.

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Electronic: may be intercept of communications, satellite transmissions, civilian phone calls, video from airline overflights, and the use of video and infra red sensors mounted on your own drone or regular aircraft and surveillance rockets and missiles. Local electronic sensors can be used for patrolling and providing nearby early warning. These can be mounted and monitored on treetop, building roofs, hilltops, or you can improvise your own hilltop by mounting surveillance equipment on top of cranes and lift equipment (piggyback systems if necessary). The lifts used for portable lights at football stadiums combined with modern optical systems and computers would allow for looking over hills and buildings and would provide a tremendous early warning and targeting system for friendly forces. It should be made a standard part of all military units and makes a good substitute for low flying surveillance helicopters.

Many mounted weapons could be lifted and operated by remote control without exposing troops to direct enemy fire. Entire combat forces could function this way, substituting for guard towers and posting patrols. Mini lift systems could even be used in jungles, forests and difficult to reach urban terrain. Fighting over and around obstacles by remote sensor has to be the way of the future wars. Adapting the wide array of modern material lifting and handling equipment to gather intelligence and aid in this type of fighting is essential.

Even police forces have a need to be able to remotely deliver video and audio systems by crane or lift devices to windows and vents to gather intelligence on hostage and armed hostile situations. The ability to combine this capability with remote delivery of nonlethal ordnance would increase public confidence in the law enforcement profession.

The ability to detect sound, and high resolution video in the visible light, infra red, electromagnetic, and radio spectrums greatly increases the tactical intelligence available to local commanders. These sound and various video and camera systems are readily available and commercially sold throughout the western world. Using all of these systems to gather information on an enemy can give you a quick idea of what he is up to.

Human: sources of intelligence can also be valuable. Finding people who have lived and have home movies and maps of the enemies home areas are of great value. Some of these may be useful as direct spies, double agents, saboteurs, moles, couriers, defector recruiters, assassin's, interrogators, and analysts.

Technical: intelligence is important because capturing or being able study enemy machines of war will tell you how to beat them. How thick the armor is on their vehicles will tell you where to plant demolition of fire ordnance at. The thickness also tells you how large you have to make your own anti-armor explosives and gives you something to test and practice on. Can air filters running the engines be plugged with certain types of smoke. Can the drivers be blinded easily by gas or smoke weapons. Is the enemy using high explosive bullets and shells, or armor piercing ordnance. Can these be defeated easily by different armor systems. What type of camouflage cannot be picked up by their surveillance systems.

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Once you have gathered the "intelligence", what do you do with it. The obvious first choice is apply it directly to the military operations by establishing effective defense where he is likely to strike and attacking weak areas where you have obvious superiority and can achieve results easily. There are many non combat and indirect uses of intelligence. These include

Camouflage of your troops and setting up falsely camouflaged or fictitious defenses.

Sending false and deceiving communications, radar, and other signal to mislead the enemy

Planting false information in the media or with spies. Inflatable dummy tanks also work.

Planting double agents to pretend to spy for the enemy and lets you know what he knows about you.

Sabotage or destroying key enemy installations. This can even include unlikely or nuisance targets such as water, sewer, television, garbage, mail and other communication and public service facilities, plants and vehicles.

Assassination is useful when the enemy has certain skilled or talented leaders that they cannot easily do without.

Disseminate propaganda behind enemy lines

The gathering of all possible intelligence when faced with a war situation is critical. Building files of information and keeping them will always be useful, especially gathering information during peacetime when it is easiest to collect. Its a little late if you wait until the shooting starts.

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4. Communications and Electronic Warfare

The importance of secure communications, intercepting and decoding enemy communications, and waging electronic warfare is easily understood when events like Pearl Harbor, the surprise attacks of Germany into Russia in 1941, the Battle of the Bulge, the Chinese intervention in Korea, the TET offensives during Vietnam, the Israel attack in 1967 to seize the Suez canal and Golan heights followed by the Arab riposte in 1973, occur repeatedly in history.

Surprise seems to be the watchword for great military successes and disasters. The element of surprise is achieved by moving men and resources to unexpected positions and sending them on to their objectives without anyone knowing about it until the event takes place. In order to do this the elements of deception and camouflage must be used to their best effect. More than anything else, all communications must be kept secure or the "cat will be let out of the bag" with potentially disastrous consequences.

Being able to intercept the enemies communications have also had great effect on military successes and failures. The more notable examples were the Soviet defense of Kursk after spies intercepted the key German battle plans, the US shooting down of Yamamoto's plane during mid WW2, and many of Rommels North Africa successes.

The use of radio, wire, microwave and satellite transmissions combined with scrambling and encoding devices allow for transmitting and receiving instant messages. Combined with modern computers and fiber optic cables, the ability of someone to pick up the potentially huge flow of information and decoding it in a timely fashion becomes increasingly difficult.

Yet, when war comes, the ability to monitor enemy transmissions and protect your own become life and death matters. To secure your own communications, the use of fiber optic wires reduces the likelihood of interception by wiretap. Adding an encoding system and decoder at the receiving end improves the security. Being able to use computers to compress data thereby reducing the flow of information in one area and broadcasting volumes of gibberish in another area can mislead the enemy as to troop dispositions, concentrations, and intentions.

The other forms of electronic signatures such as radar to provide warning or locking onto of enemy aircraft must be kept to a minimum. The use of passive early warning such as detecting the infra red, video, and electronic emissions of an incoming target can help protect your electromagnetic sources. In today's world, missiles are used to home in on radar, communications, and radio sources and destroy them. The use of cellular phones led to the homing in on and death of the Chechen leader from a homing missile attack in recent years.

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In improvised warfare it may be hard to accomplish secure communications, much less intercepting an enemies. The effort must be made. Scanning equipment is commercially available in the western nations which can quickly locate active emissions of almost any frequency. Recording equipment can capture the transmission for later decoding by computer assisted analysts. Even information such as the direction and frequency of traffic combined with other intelligence can give an idea of enemy intentions. Using fax and computer equipment to transmit your own messages and doing so remotely or through proxy transmitters can save losses through an enemies use of anti-radiation missiles. Gaining fixes on enemy transmission from two directions can let you counter likewise with emission guided weapons, or direct assault by artillery, rockets or ground forces (commando's).

Techniques such as jamming enemy emissions can be helpful if you can create the powerful signals needed to counter an enemies. Laying down and burying your own secure lines between headquarters is helpful. Setting up satellite communications also makes it hard to be intercepted anywhere in the world. Having access to the weather channel and CNN has even influenced modern wars.

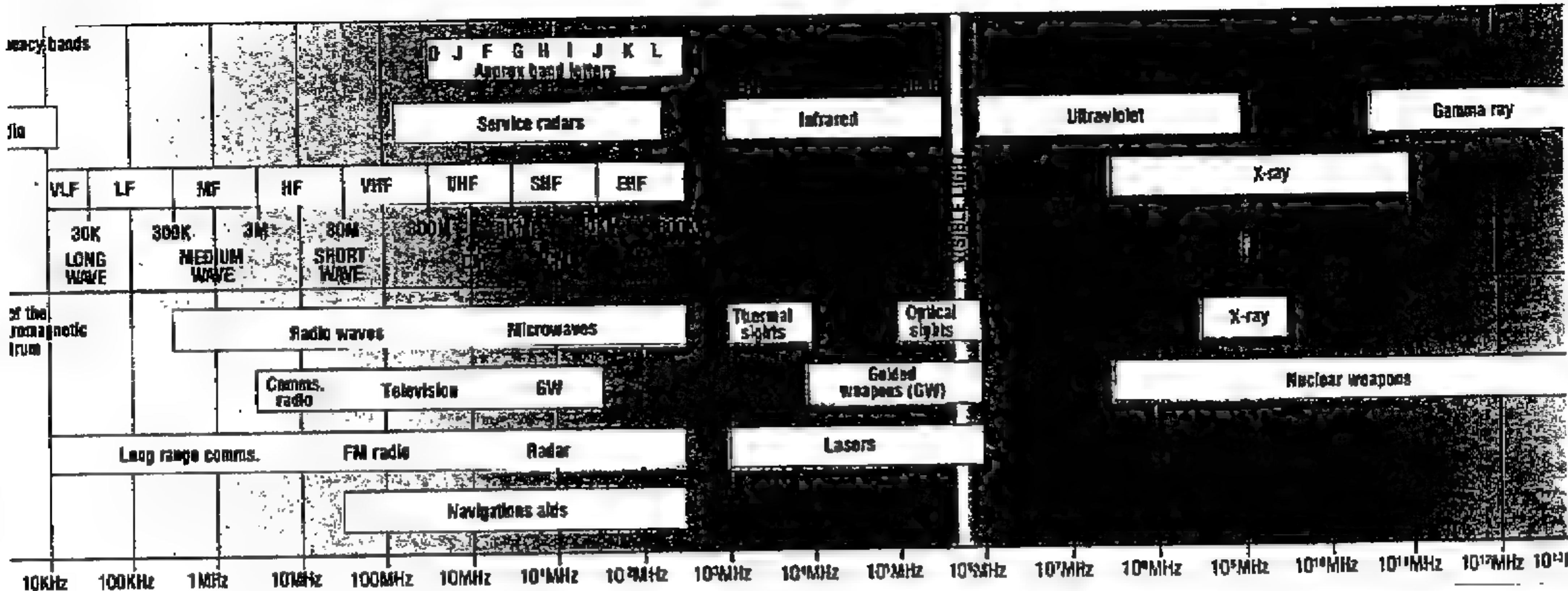
Electricity and electronics can also be used be used as weapons in the form of stun guns, electrocution used in assassinations, and electromagnetic pulses used to damage electronic equipment

An advance inventory of trained personnel and equipment is essential for

- Radios
- Scanners
- Direction Finders
- Computers
- Microwave
- FiberOptic
- Satellite systems
- Encryption and decoding
- Lasers
- Infra-Red and thermal imaging

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The following chart of frequency band designations can give you an idea of what is needed to cover the potential emissions spectrum.



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5. Survival and Evasion

One of the most important skills that individuals can learn and pass on to others is how to survive. These skills can enable entire populations to survive terrible conditions if the will and know how is there. Countless stories can be repeated from history illustrating survival, from Leningrad during the Nazi invasions, to the recent example of an Air Force pilot shot down over Bosnia. This is not a book about survival, and if an individual believes he may one day be faced with a survival situation, he should equip himself with the tools and a library to help in this regard. I will cover the highlights and some improvisation methods that can help. The most important aspects of surviving and evasion are:

- Attitude
- Terrain and Climate
- Water
- Food
- Oceans
- Shelter
- First Aid
- Group Survival
- Firebuilding

Attitude

In surviving, attitude is everything. The ability to cope with fear, pain, cold, thirst, hunger, fatigue, boredom, and loneliness depends on attitude and know how. Most of mankind had to live every day of his existence with all of this through thousands of years of struggling, before man organized and civilized his activities. Modern tribes all over the world survive every day in jungles, deserts, the arctic, the ocean, and so on, and they think nothing of it. It is part of their everyday existence. The difference is that they learned growing up how to cope with their environment.

This act of learning how to cope and having a "can do" attitude is what allows POW's and crash survivors make it, and allows natives to live comfortably every day in harsh conditions. The difference is that we have become accustomed to comfort. When we are forced in an abrupt way to live without air conditioning or heating, without a meal at the local food outlets, and having to walk any great distance, we become uncomfortable. Combine this with the prospect of an enemy trying to hunt you down and fear begins to set in. How you handle the new combination of stresses determines how you live and if you live.

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Most of the symptoms described above may come from discomfort rather than any real injury or exposure. Your attitude that recognizes that your current discomfort is only temporary and can get a lot worse if you are captured by the enemy can help you make it. Comfort is not essential, surviving is. Your body and mind can take incredible amounts of mental and physical discomfort for long periods. Anyone who doesn't believe it only has to look at Marine boot camp or the survival schools. The following attitudes will help you make it-

I can make up my mind
I can take it
I am not about to let the other ____ win
I can improvise
I can live on my own (at least for a while-and give the rest of the world some peace)
I keep cool, calm, and in control
I am patient
I can't help the situation I am in, but I can do something about it

I can cope with

Fear: by knowing my equipment, knowing my comrades, knowing my abilities and concentrating on the job at hand
Pain: by being too busy to bother with it. If I am injured I know how to treat it.
Cold: by knowing how to keep warm or building a shelter and fire if it becomes serious
Thirst: by cutting food intake when supplies are low and knowing how to obtain and use water from my surroundings
Hunger: by knowing how to collect edible food and recognizing I can live on very little food
Fatigue: by limiting activity or changing the current activity and having a clear goal and summoning the strength to reach it
Boredom: by getting interested in something and finding something to do-like survive
Loneliness: by knowing how well trained and self sufficient I am and big a party I will have when this is all over

Scientific Principles of Improvised Warfare and Home Defense

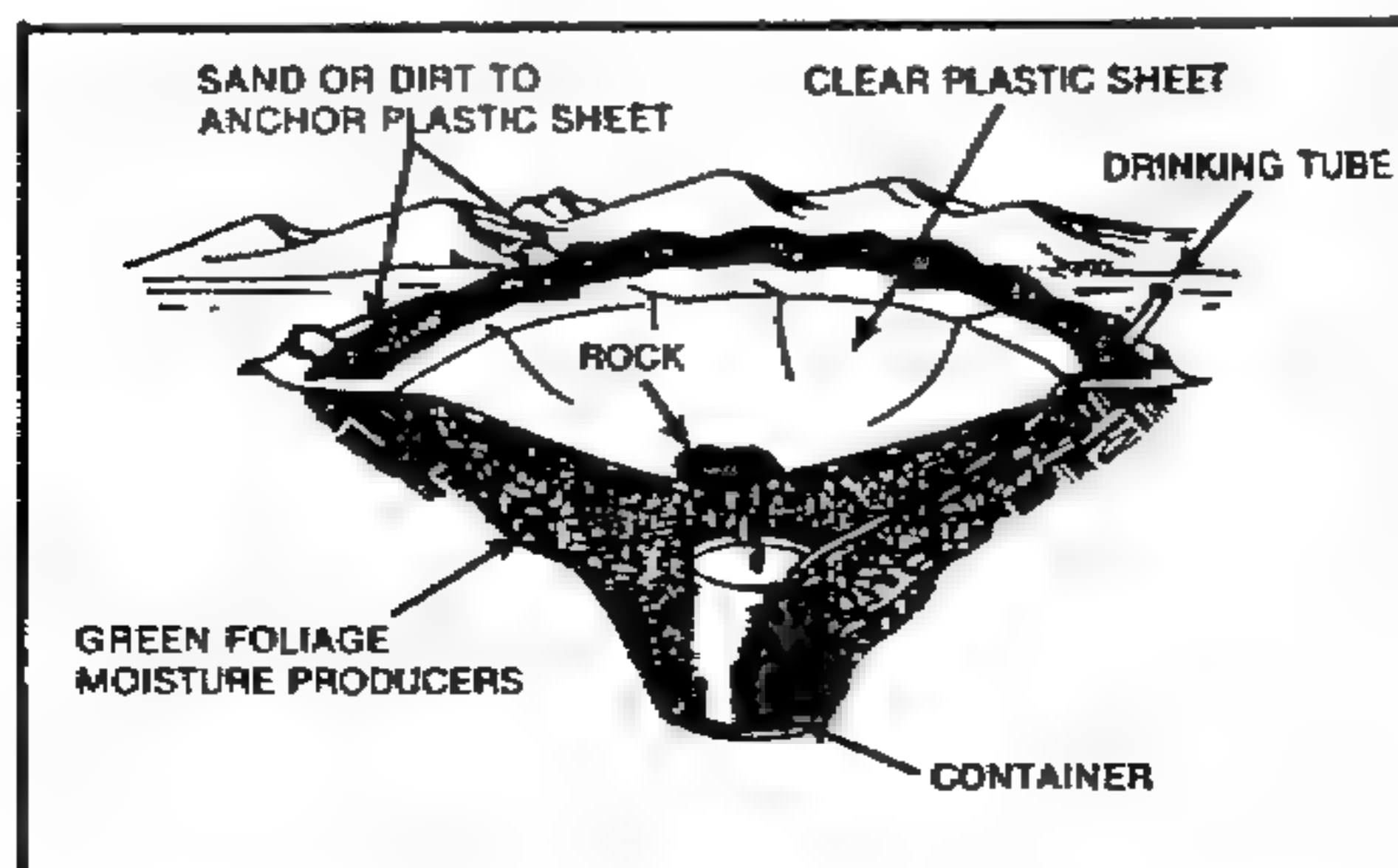
Terrain and Climate

Your surroundings determine how you set priorities, with the greatest threat to surviving being dealt with first. The main types of terrain encountered are deserts, jungles, mountains, polar terrain, and areas where survival is easiest- forests and plains.

Deserts: are demanding to physically move through, are difficult to navigate, and are hard to hide in. With high temperatures and hot blowing wind, the first priority is water. Finding shelter (in dry washes with thick vegetation) during the day and traveling by moonlight (with warm clothing) work best. Use cover that reflects sunlight and place them in the shadow of other plants or dune walls. During the likely once a week sandstorms, mark your direction of travel and lie down, cover your mouth and nose with cloth and ride out the storm. Noise and light carry a long way at night and there are no mirages. Avoid traveling without moonlight. Use a compass and select a consistent route. Sweating is the main cause of water loss-avoid activities that cause sweat if water is limited. Let your clothing absorb the sweat and keep it on using it to protect you from the heat. Breathe through your nose to and minimize talking to conserve water internally. If water is short, do not eat. Eating requires water for digestion. Do not ration water, sip small amounts regularly

Obtaining water in the desert can be accomplished by a variety of means

- *Digging in the outside curve or bend of a dry river bed and letting the water collect
- *Sopping up morning dew from rocks and metals with cloth and wringing it out
- *Making a water still by digging a hole in the sand, placing a can or container in the bottom and covering the hole with a sheet of plastic. Push the center of the plastic down to form a cone and use a rock to weight the center down to a point over the can. As the air under the plastic gets hot, ground moisture evaporates and condenses on the underside of the plastic. The drops run down and collect in the container. You can use a tube to draw the water without disturbing the still. Adding vegetation inside the hole will increase the moisture collected. You can also use this method to collect dew by piling rocks on the plastic in the morning.



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There are burrowing animals and snakes that come out at dawn and dusk. These can be snared or trapped for food. Avoid any plants with milky sap.

If equipment is available and shelter is limited, build a tower so that you can get 6-10 feet above the desert floor during the day. The temperatures are significantly cooler there.

Jungles: can provide food, shelter, water, and tools and are easy to survive in and live in if you chose to. Howls, screams and other noises can be frightening but usually represents no real danger.

Build shelter early before nightfall at a high spot or knoll if possible. There will be fewer insects and the ground is dryer. Build a bed or hammock above the ground as far as possible with an A frame covering to keep rain off. Use all materials available for insect netting and protection. Keep pant cuffs tucked in and tied securely, sleeves rolled down and buttoned, and inspect all clothing and body parts daily and rid yourself of attached insects (usually by burning off if they cant be brushed away).

Dry clothes by hanging near fires at night. Make fires each night if possible for cooking, heat, drying off, and smoking out insects. If dry tinder is hard to find, use the inside of tree trunks (Do not use bamboo for fire). Dry out wet wood near your fire. Do not drink water from lakes and streams without purifying or boiling. You can collect fresh rain water by using a tarp or plastic formed as a cone. Banana, bamboo shoots, coconut, and papaya are usually available as food. Anything other mammals (but not birds) eat can be considered safe. Animal trails usually lead to water and all freshwater fish offer a meal. Avoid plants with milky saps. Fish can sometimes be caught by throwing pebbles close to shore in calm areas along rivers. When fish come close to investigate, they can easily be netted.

The most useful tools are

A machete to clear a path, find food, and make a raft

A compass

A first aid kit for fever or infection

A hammock and mosquito netting

Traveling is best along trails (avoiding matted areas which may be trapped. When a river is reached, it can easily be rafted downstream until a larger body of water or a settlement is reached. Only move during the daytime, avoiding night travel.

Learn to look through rather than into the jungle. Frequently look on the ground for game and insects. By developing jungle eyes you avoid many injuries and getting lost.

Do not camp near water, especially during the rainy season (flooding)

Use insect repellent on all clothes and skin. Smear mud on exposed surfaces and face and allow to dry. Buffalo dung mixed with fire ashes also works. Lemonjuice and coconut oil may also help

Scientific Principles of Improvised Warfare and Home Defense

Use tools to push brush aside and avoid anthills

Yellow-green bamboo hanging at 45 degrees often contain fresh, cool water

Cutting the stalk above and below two successive knots provides a portable water bottle

Insects and larvae from rotting stumps can make excellent meals when cooked

Large fruits with agreeable taste are usually safe, spit out any seeds or pips to be safe

Mountains

Food can be obtained from the leaves, roots, and fruits of vegetation without milky sap.

Small animals can be snared near the mouth of burrows. Sucking on ice does not provide enough water. Water must be obtained from streams or melted in quantity.

The main problems in mountains are related to altitude and cold. To combat frostbite, practice muscle contractions to improve circulation. Avoid squatting positions or crouching because it compresses the large arteries of the legs. Keep hands on your stomach or armpits to keep them warmer. Avoid clothing that is tight and may cut down circulation. Avoid contact with metal because it conducts cold.

If you experience "altitude sickness" you should descend in altitude.

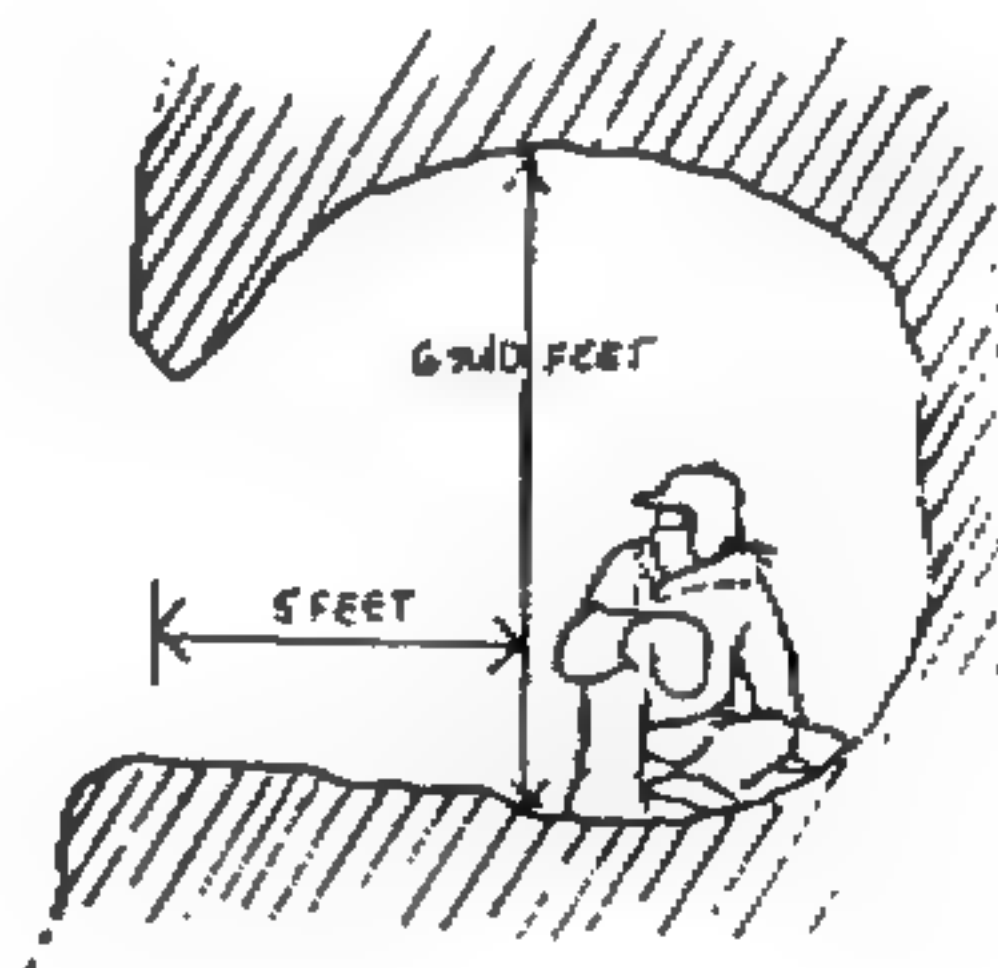
Lightning strikes are a particular problem if you are caught in the open in storms

Seeking shelter in a cave

(Large enough with no water trickling into it)

Sitting at a distance slightly less than the height of a rock provides some protection

Not touching a mountainside and sitting on insulating material with a rope attached to a foot while on a cliff.



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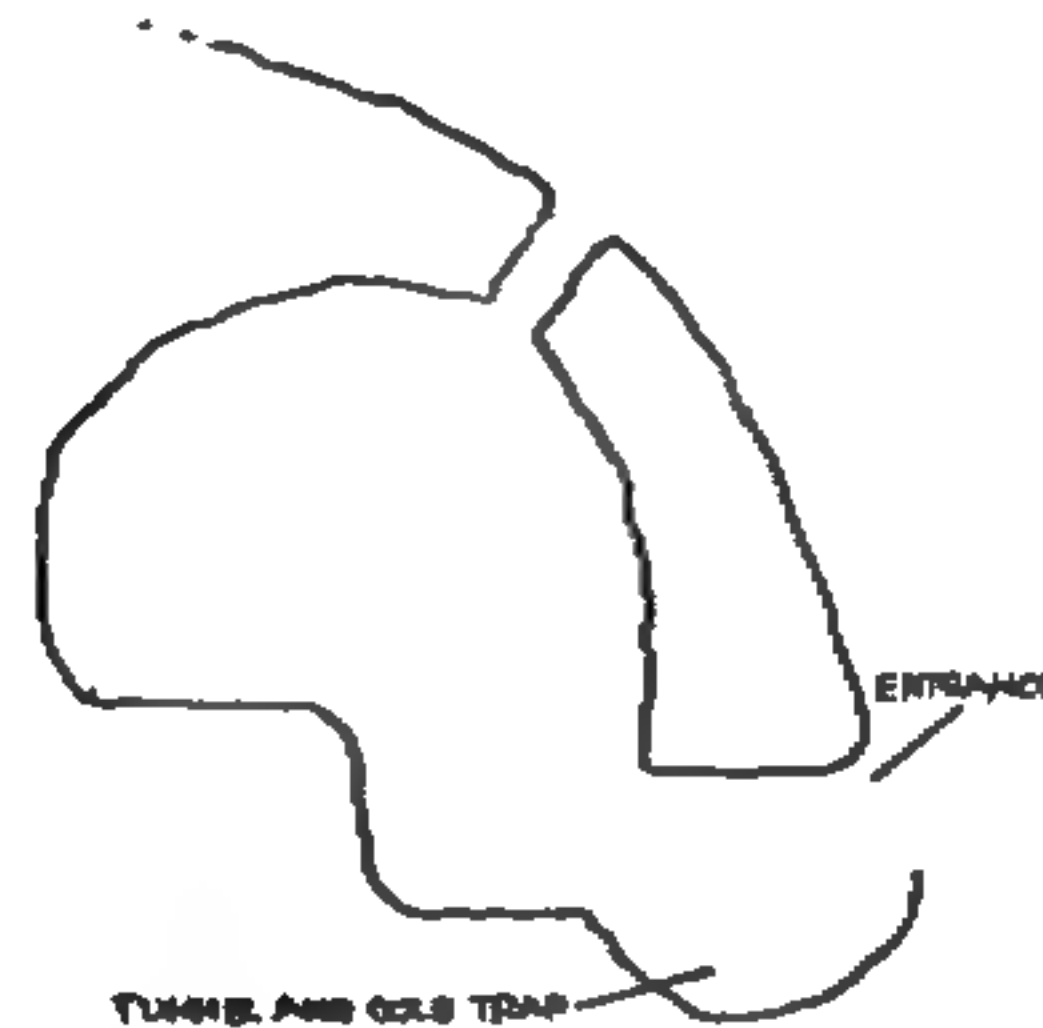
When at altitude, a tent is essential to provide protection against wind. It should be pitched behind natural or manmade obstacles to eliminate wind and should be lined to keep the inside temperature above freezing. If this is not available, digging a shelter in snow or ice 6' deep and shaped like a sock will keep radiated body heat inside if the entrance is blocked and covered with a thin layer of snow.

Polar

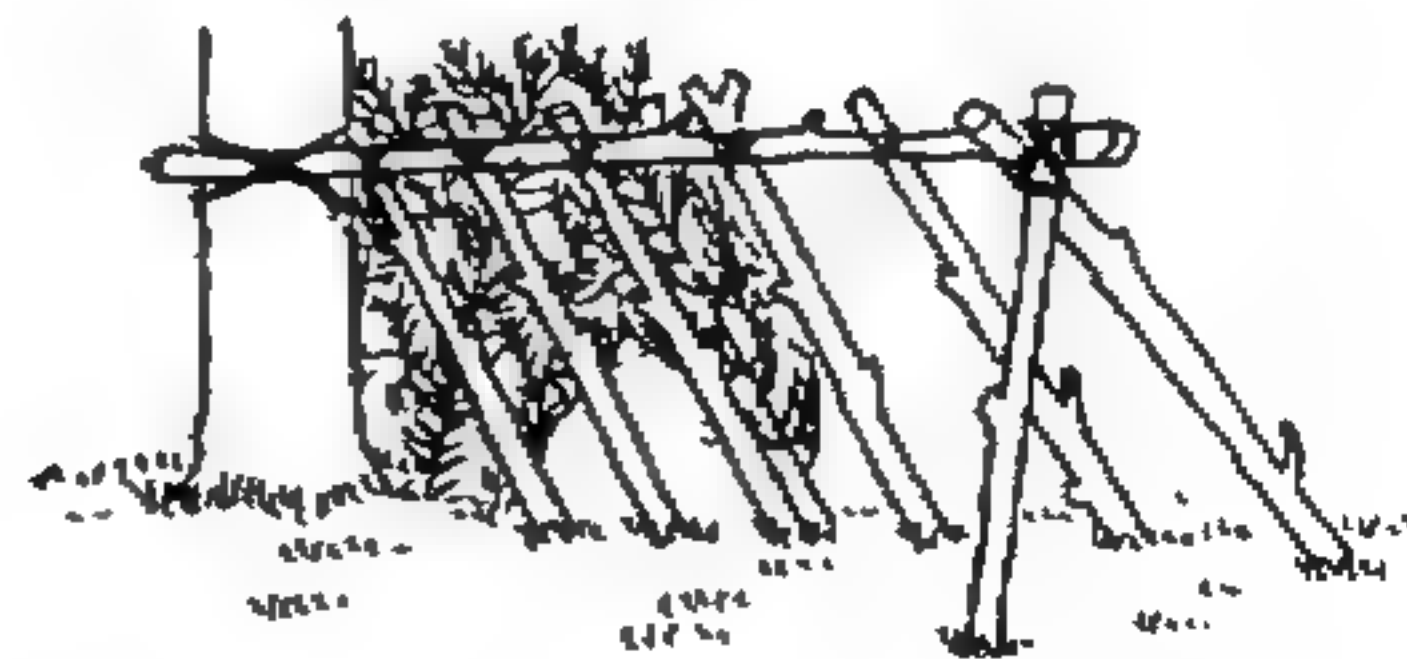
As in mountain regions, cold and wind are the main enemies. Using snow to build a shelter is best because it is 50-90% air (good insulation), and is easily molded. Piled up snow can serve as a windbreak as well.

A shelter with a sleeping area just big enough for a man and above the tunnel entrance dug out of the snow or fabricated from tent material is best.

An oil lamp or candle will keep the shelter warm.



Other shelter designs include



Using a tree or building a lean too.



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Obtaining food requires being able to hunt animals with guns or fish in deep (650') waters.

Hypothermia is a serious problem in arctic conditions. To avoid this, keep active, wear multiple layers of loose clothing, and keep your clothing dry by air drying or carrying against the body. Hygiene must be continued by taking a snowbath every two days and washing the feet daily and putting on clean socks.

Hills and plains provide plentiful food and water and require only local knowledge of obtaining food and shelter.

Water

Water is the most important survival item. Most of our bodies are made up of water. If a reliable source is not readily available, it must be procured from the environment. Including methods already described, water can be obtained by

- Melting snow and ice
- Desalinating water
- Catching rain in tarps and containers
- Digging near green vegetation and outer bends of river beds
- Morning Dew
- Condensation on metals
- Building water stills
- Plant roots

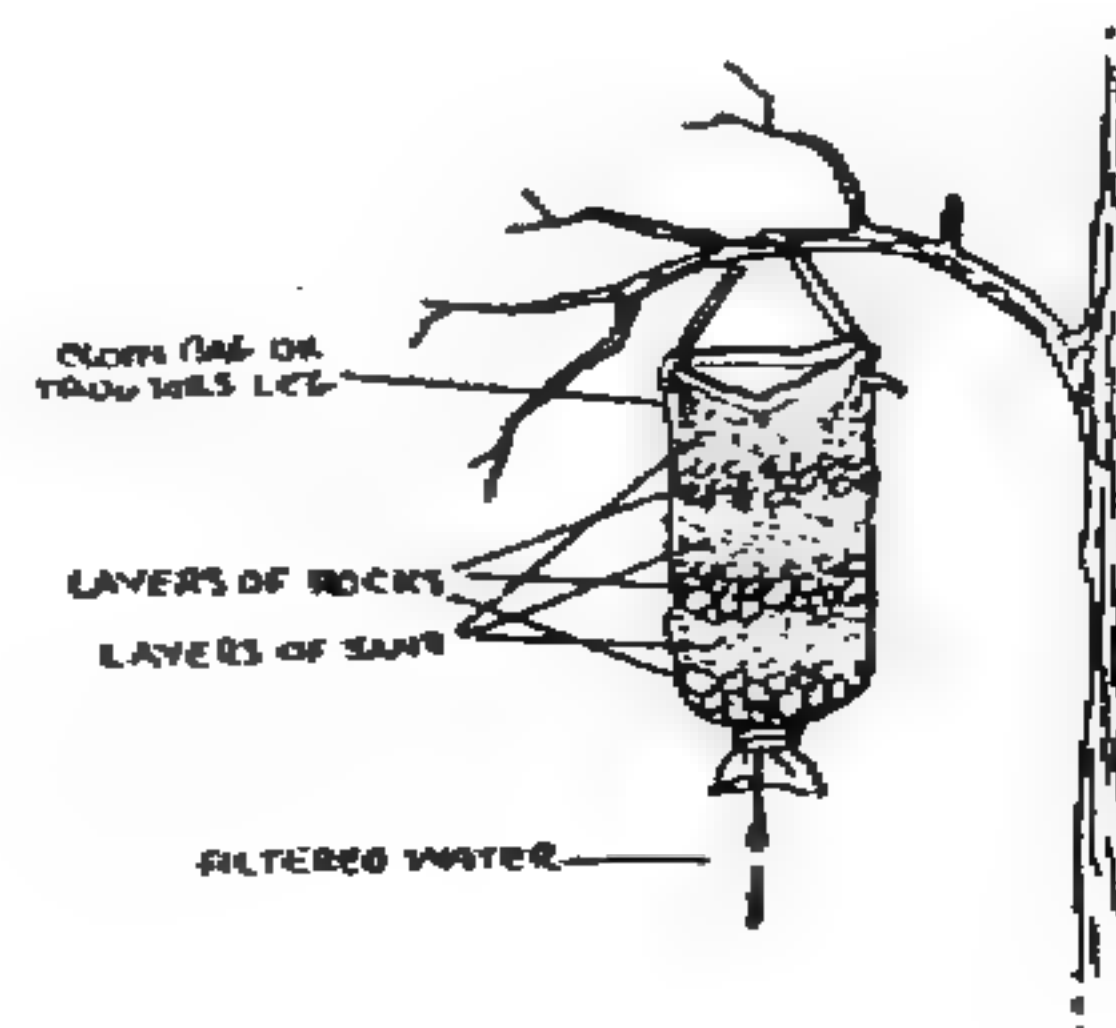
Large amounts of water can be absorbed by mopping up morning dew in cloth and wringing out. Water can be purified from still ponds by building the still previously described and surrounding the apparatus with a trough for the polluted water. Water can also be purified in most cases by boiling and/or condensing.

Stagnant water can also be cleared by

Placing it in a container and letting it stand for 12 hours and using the top clear layer

Building a natural filtering system as illustrated

Odor from water can be removed by adding charcoal from your fire for about 45 minutes.



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Small amounts of seawater can be drunk in amounts that correspond to the required daily salt intake, or about 1 pint daily in 2-3 mouthfuls at a time for a maximum of 5-7 days. Fish and rainwater should be used to supplement water supplies. Use a torsion skein to squeeze out water from small cut cubes of fish tissues. The eyes are about 90% water. Small amounts of urine can also be recycled but only for 2-3 days at one pint limits per day.

Food

Plants, animals, insects, and fish have fed all of the human race through history. Individual survival can be almost assured in most parts of the world by intelligent foraging. Group survival such as large, starving cities require organized farming, foraging, fishing, and bartering efforts to feed.

Most plants and trees have edible parts. If it is unknown what parts are safe to use, the following "Universal Edibility Test" should be followed.

1. Test only one part of a food plant at a time
2. Break the plant into its basic components-leaves, stems, roots, buds, or flowers
3. Smell the food for strong or acid odors
4. Do not eat for 8 hours before starting the test
5. During the 8 hours you are abstaining from eating, test for contact poisoning by placing a piece of the plant part you are testing on the inside of your elbow or wrist. Usually 15 minutes is enough time to allow for a reaction.
6. During the test period, take nothing by mouth except purified water and the plant part tested
7. Select a small portion of a single component and prepare it the way you plan to eat it
8. Before putting the prepared plant part in your mouth, touch a small portion (a pinch) on the outer surface of your lip to test for burning or itching
9. If after 3 minutes there is no reaction on your lip, place the plant part on your tongue, holding it there for 15 minutes
10. If there is no reaction, thoroughly chew a pinch and hold it in your mouth for 15 minutes. DO NOT SWALLOW

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11. If no burning, itching, numbing, stinging, or other irritation occurs during the 15 minutes, swallow the food

12. Wait 8 hours. If any ill effects occur during this period, induce vomiting and drink a lot of water

13. If no ill effects occur, eat 1/8 cup of the same plant part prepared the same way. Wait another 8 hours. If no ill effects occur, the plant part is safe to eat.

Caution: Test all parts, do not assume that if one part is safe that all parts are

Do not eat unknown plants that

1. Have a milky sap or if it turns black when exposed to air
2. Look like mushrooms
3. Resemble onion, garlic, parsley, parsnip, or dill
4. Have carrotlike leaves, roots, or tubers

Parts are prepared for eating by

[Leaves, Stems, Buds, Roots, and Tubers]

Boiling to tenderize and break down toxins, use several changes of water if in doubt

[Nuts]

Leach or soak in water to make palatable

[Grains and Seeds]

Grind to a meal for use as a thickener in soups or for flour for bread

[Sap]

If it contains sugar, boil to remove the water

[Fruit]

Bake, Boil, or Roast

If you do not have a container to cook foods in, large rocks can be placed on your fire and the food and cooking fat placed on the rocks. Boiling is best for most foods because important salts and other nutrients are retained. Various pits can be dug and lined with rocks to create simulated stoves when covered.

Insects such as ants, termites, locusts, and especially large grubs (larvae) found in rotten logs and dead tree bark are excellent food sources and are easily caught by hand. The best way to eat them is to cook them in a soup with other palatable food if you are not used to the idea of eating what much of the rest of the world lives on.

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Nearly all bodies of water contain fish which can easily be caught by net, hook, or spear.

Snakes, turtles other reptiles can be found in most terrain types around the world.

Birds are found nesting in trees and can supply a steady source of eggs if you leave 2-3 eggs each time and return every week or two. Do not disturb the nest. Birds can be caught to eat by use of a noose on the end of a stick or setting up a net between trees that the birds frequently fly between.

There are many snares and traps that may be used to capture small game.

Reptiles, fish, and game can all be prepared in ways similar to preparing plant foods. Smoking should be used on foods that need to be preserved for later eating by setting up a teepee and set a fire of green broadleaf wood underneath. The smoke will preserve the meat for 2-4 weeks if it is hung 3' above the fire for 1-2 days. A covered pit can also be used. Soaking in saltwater and drying by hanging in the sun or near a fire will also preserve meat.

Game should be skinned and gutted with the blood used in soups and the skin used for leather.

Oceans

Survival at sea depends on your equipment, your knowing how to use it, and your will to make it back to dry land.

If you are down at sea-

Find a raft or debris to cling to or crawl on

Relax, your body's natural buoyancy will keep your head at the surface and only a small effort is needed to put your mouth above water and take the necessary breaths

Floating on your back takes the least energy

Use your pants for flotation by taking them off, tying knots in the legs, and catching air by pulling them overhead.

Once on a raft, salvage all floating equipment and supplies possible

Take seasickness pills if available to avoid vomiting and dehydration it causes

Lash any other rafts to your own to keep everyone close together-its easier to spot

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Keep dry and use exposure suits, and spray and windshields, or canopy

Ration water and food

Assign duties and keep a log

If in hostile areas, drop anchor during daylight and paddle or sail at night

Use the blue side of the camouflage cloth up

If spotted by an enemy, jump overboard to avoid strafing

Improvise hooks and line to catch fish for food and water

Eat small amounts of seaweed if found

If your raft contains a still, read the instructions and set it up immediately

Make a still using the desert still principles if possible. Clear plastic can be used for a greenhouse effect and the water can be captured in a container or gutter

Use tarps and canopies to catch rainwater

Use the tarps to collect morning dew

Setup a lookout at all times for land, passing ships and aircraft, wreckage, and fish

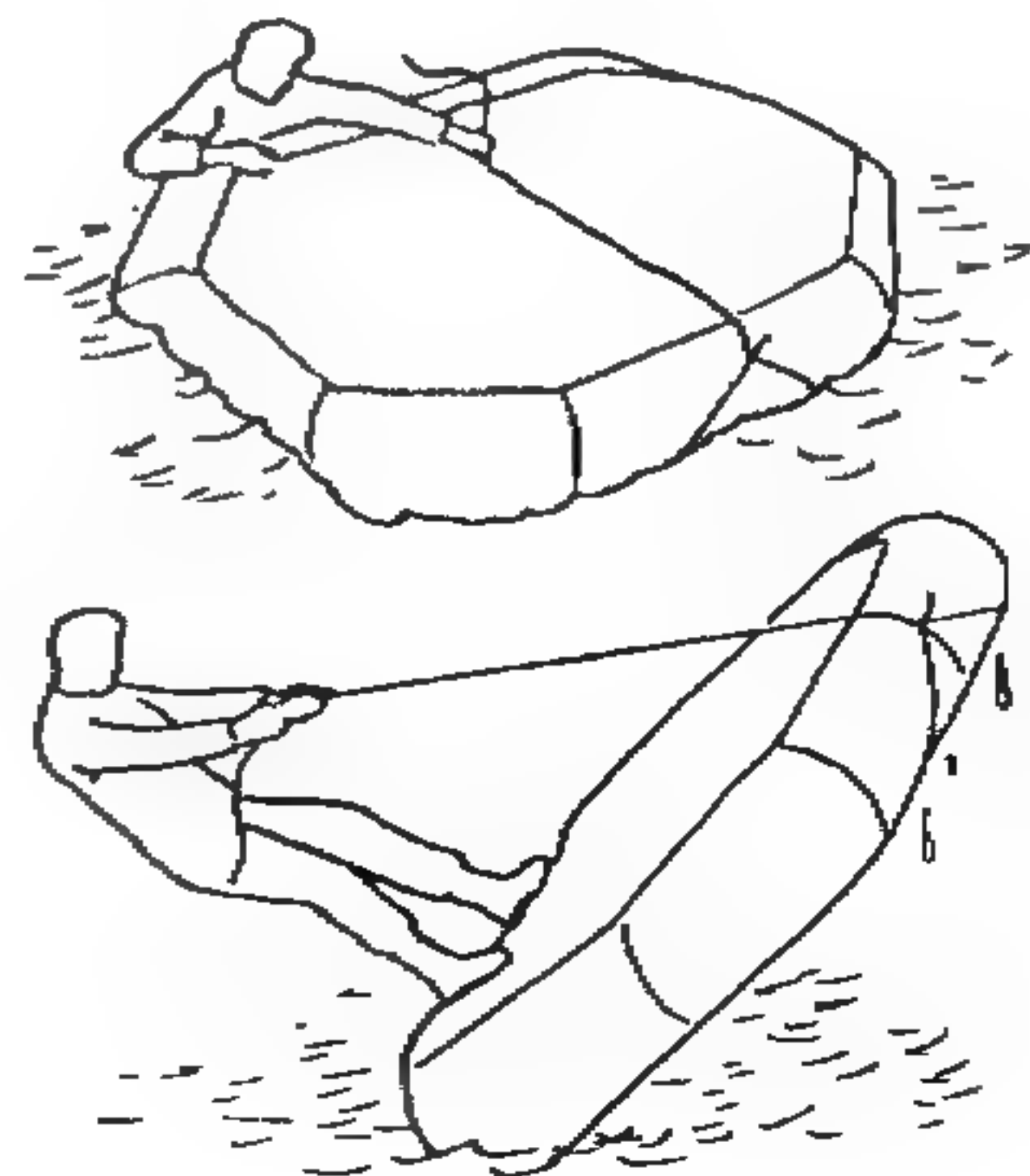
If you are in the water, throw vomit and feces as far away as possible

Urinate in small spurts allowing it to dissipate

Keep all clothes on including shoes

If your raft is overturned, right it by using a rope as shown

One piece of research indicates that water can be absorbed in the colon by giving seawater enema's without the danger of salt absorption due to its filtering membranes

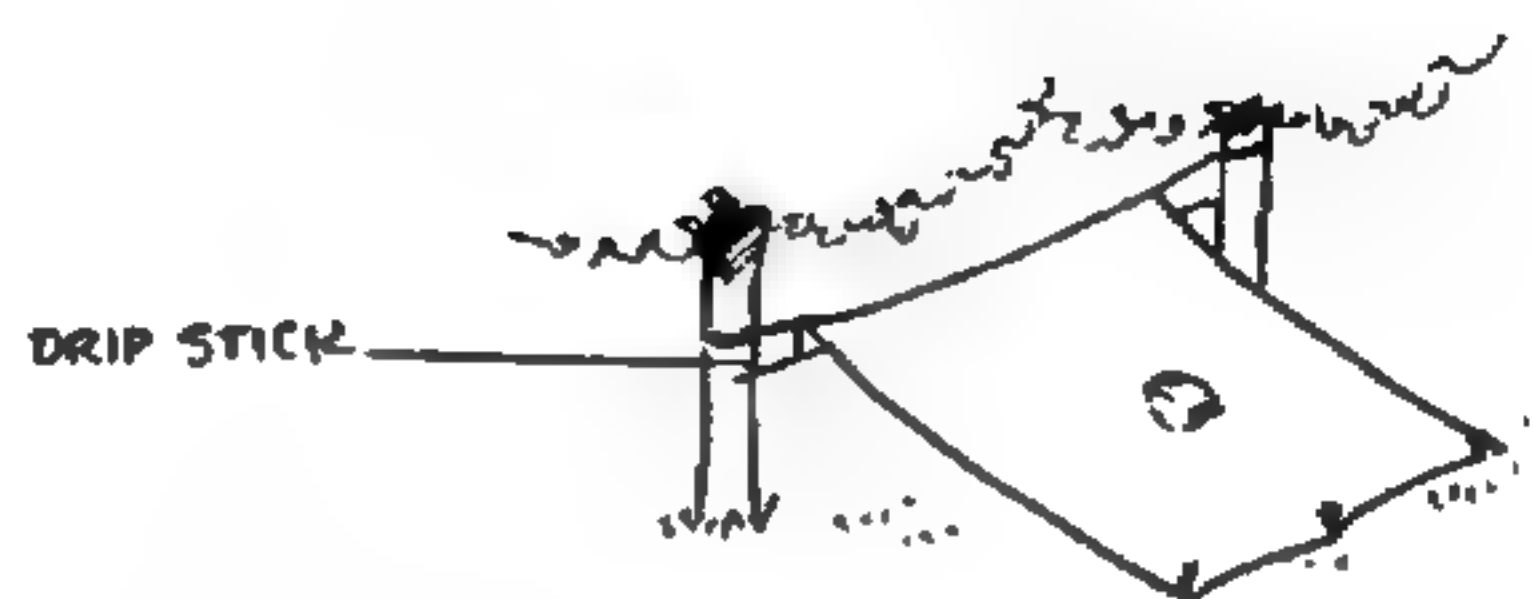


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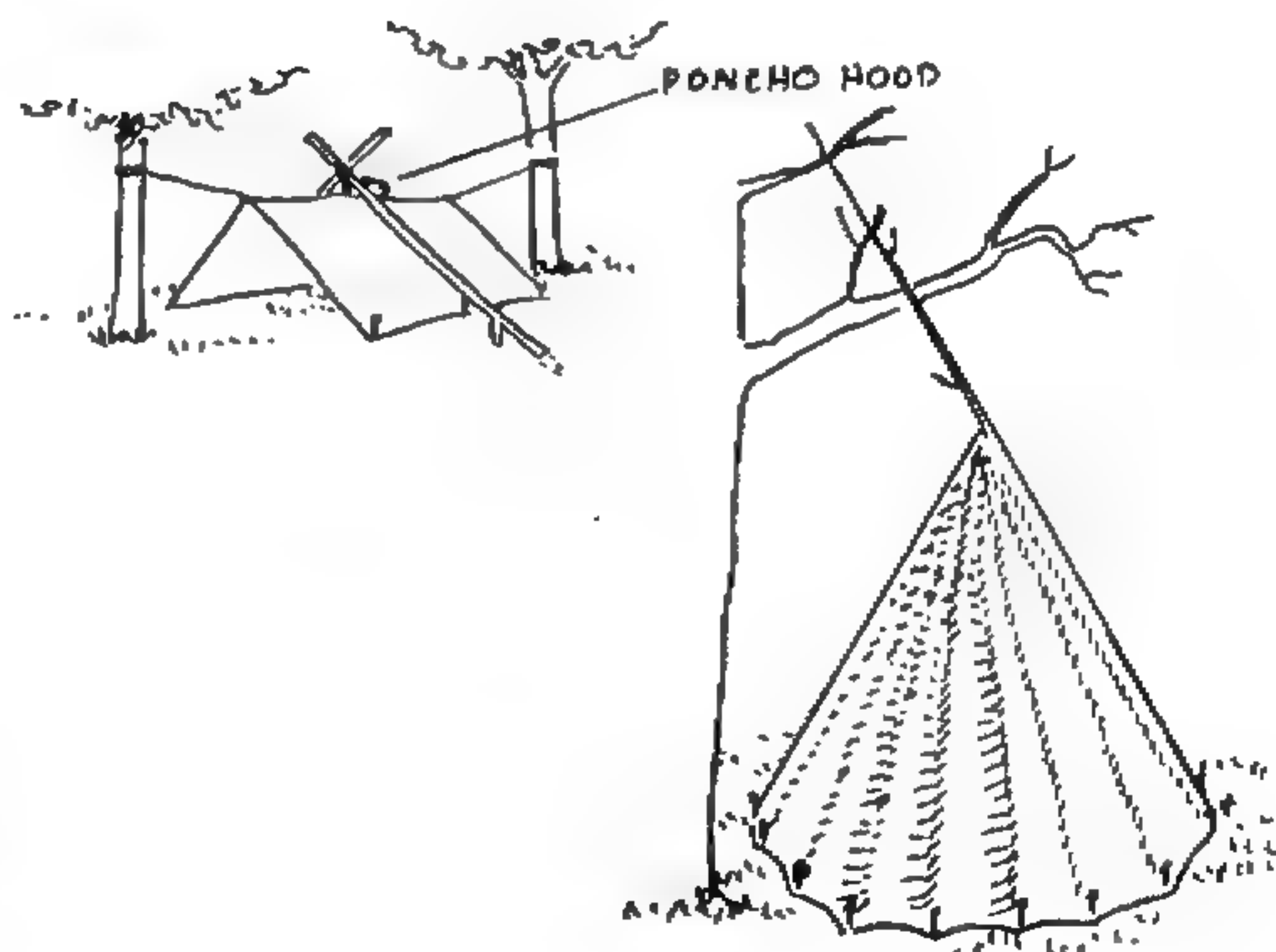
Shelter

The kind of shelter you need to build depends on the elements you need to be protected from, the time and effort it takes to build, tools at hand, and the available materials.

A lean-to tent can be made from a poncho as shown



An A frame tent can be assembled using two branches for support

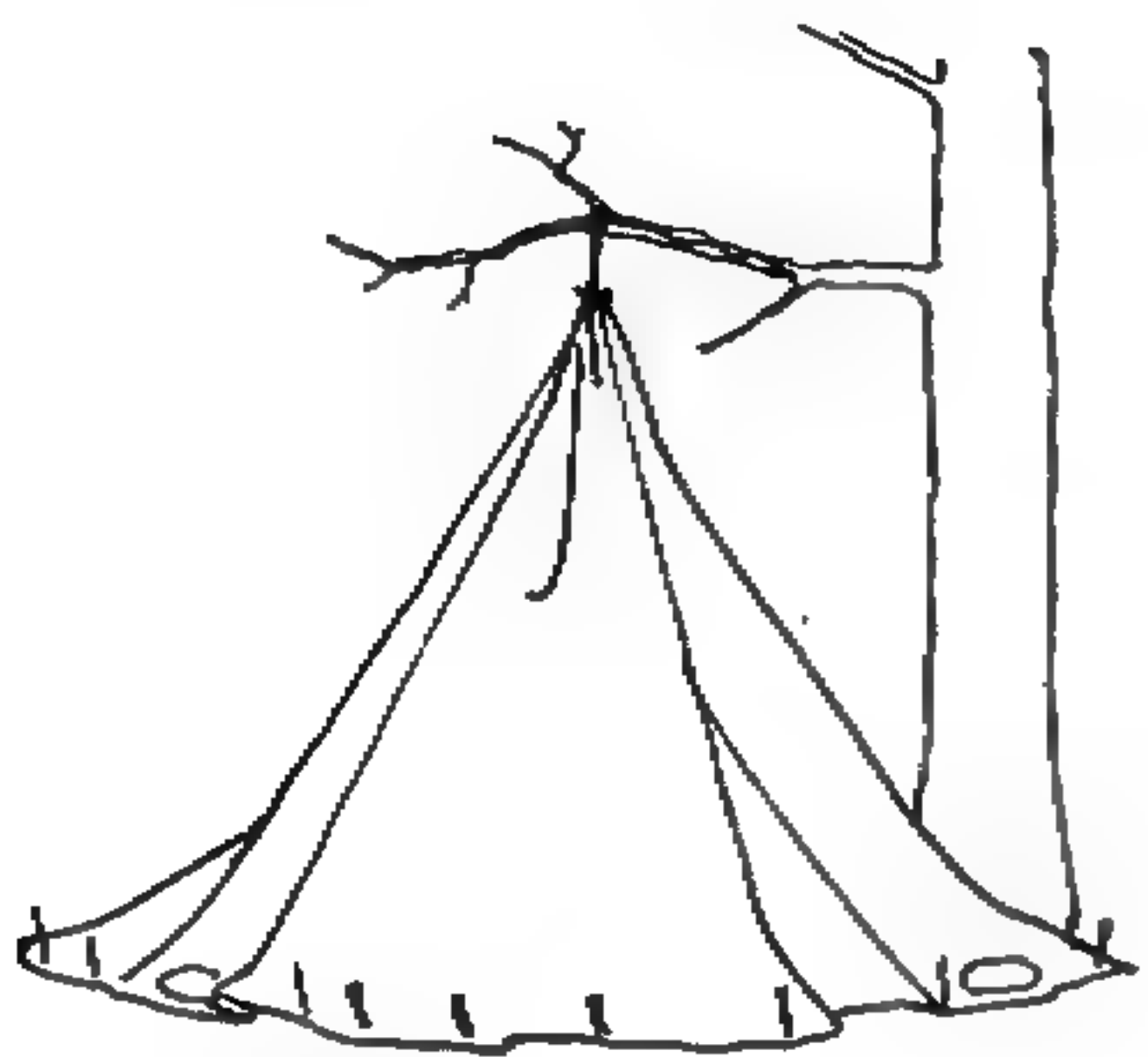


A canopy can be used with cut branches to build a teepee

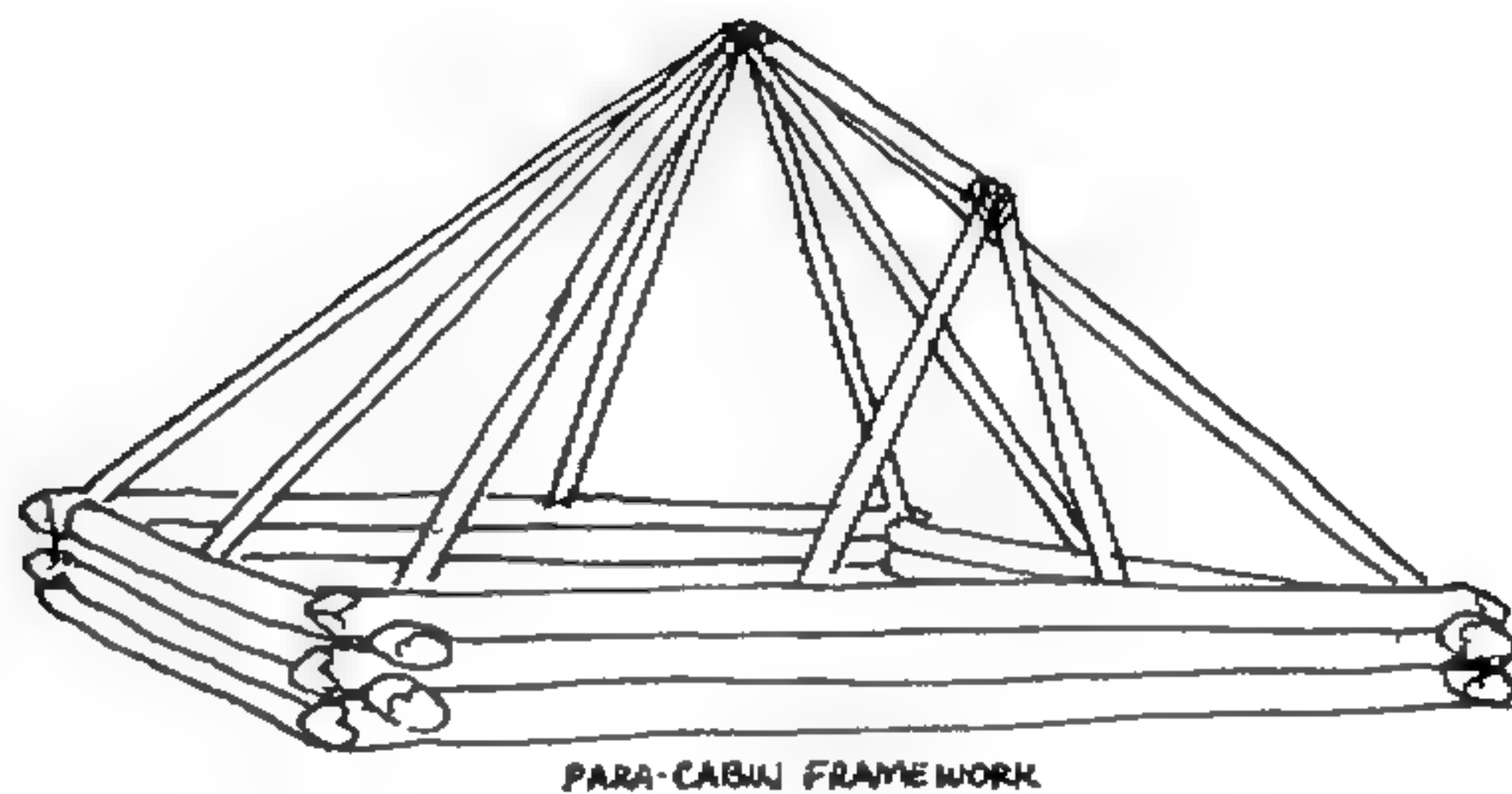
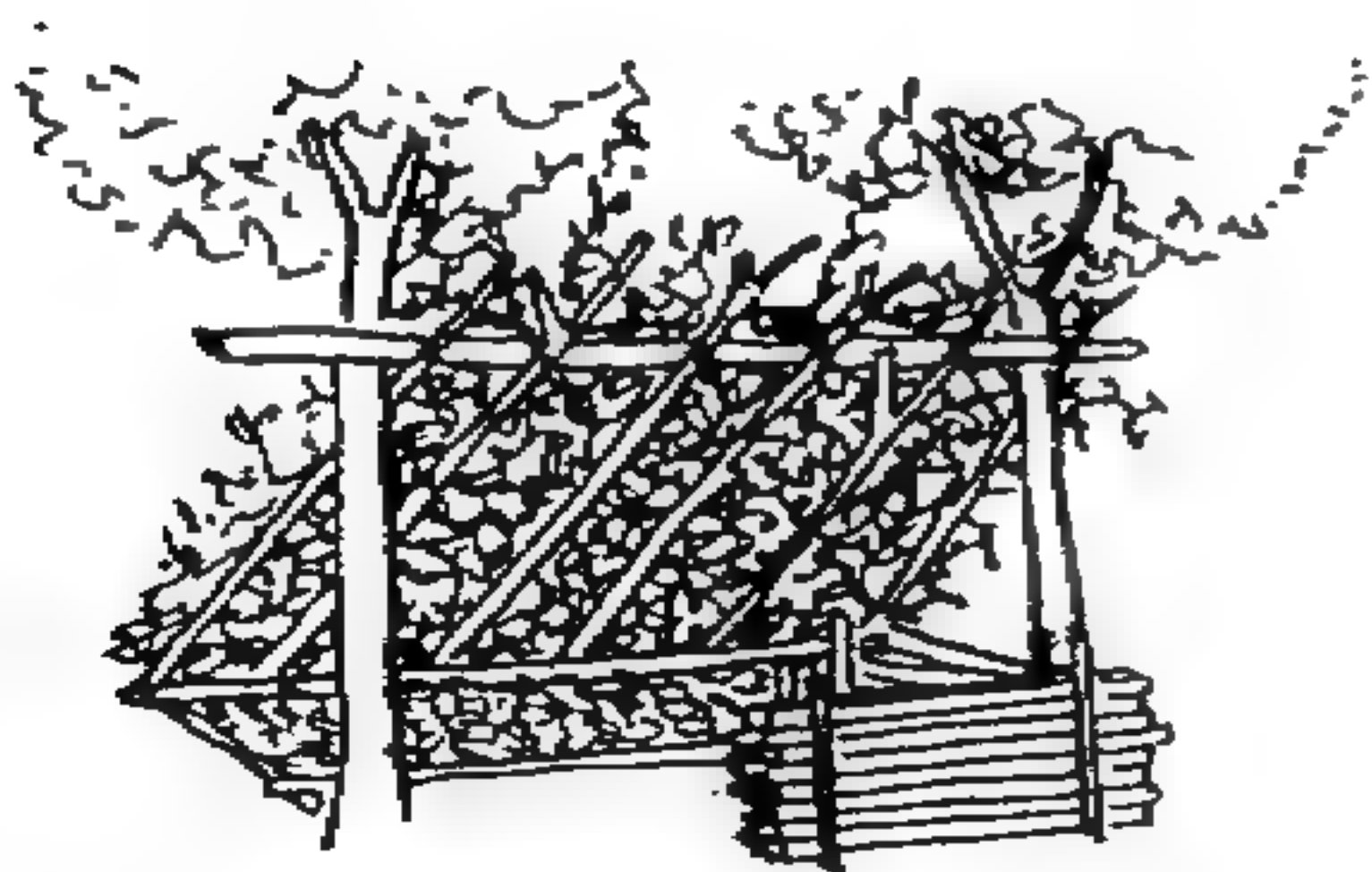
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A parachute may also be used by suspending its center from an overhead branch

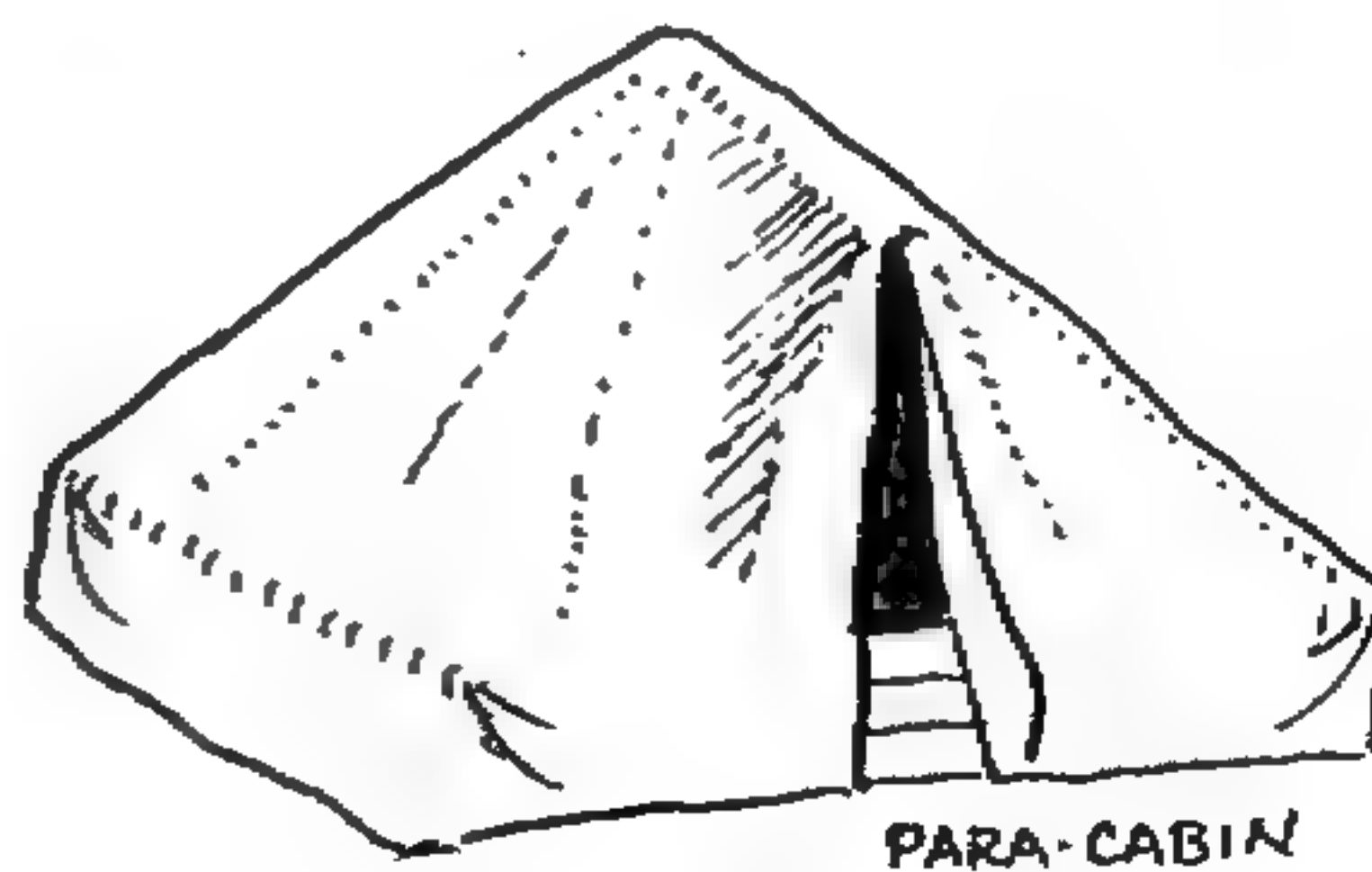
A one man shelter



A field lean-to

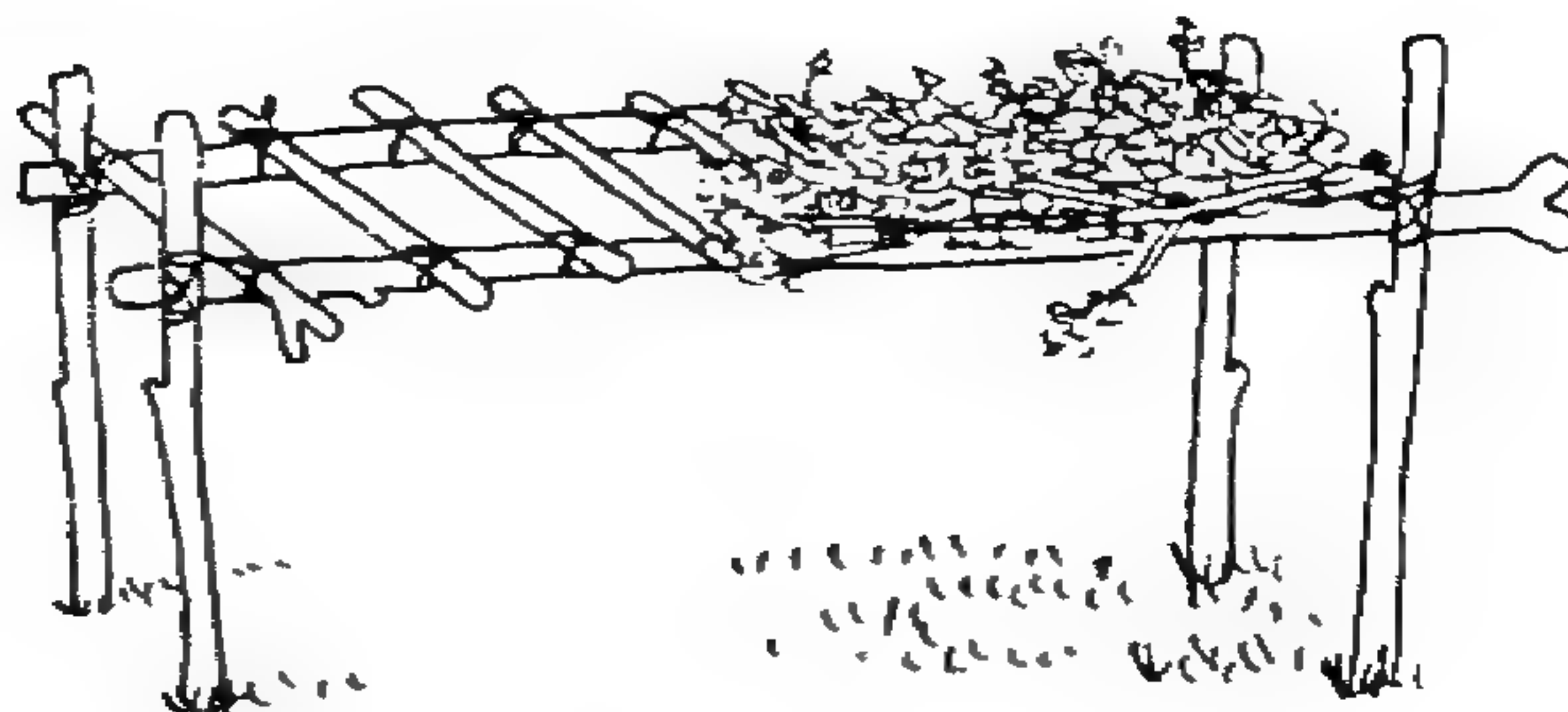


A parachute cabin



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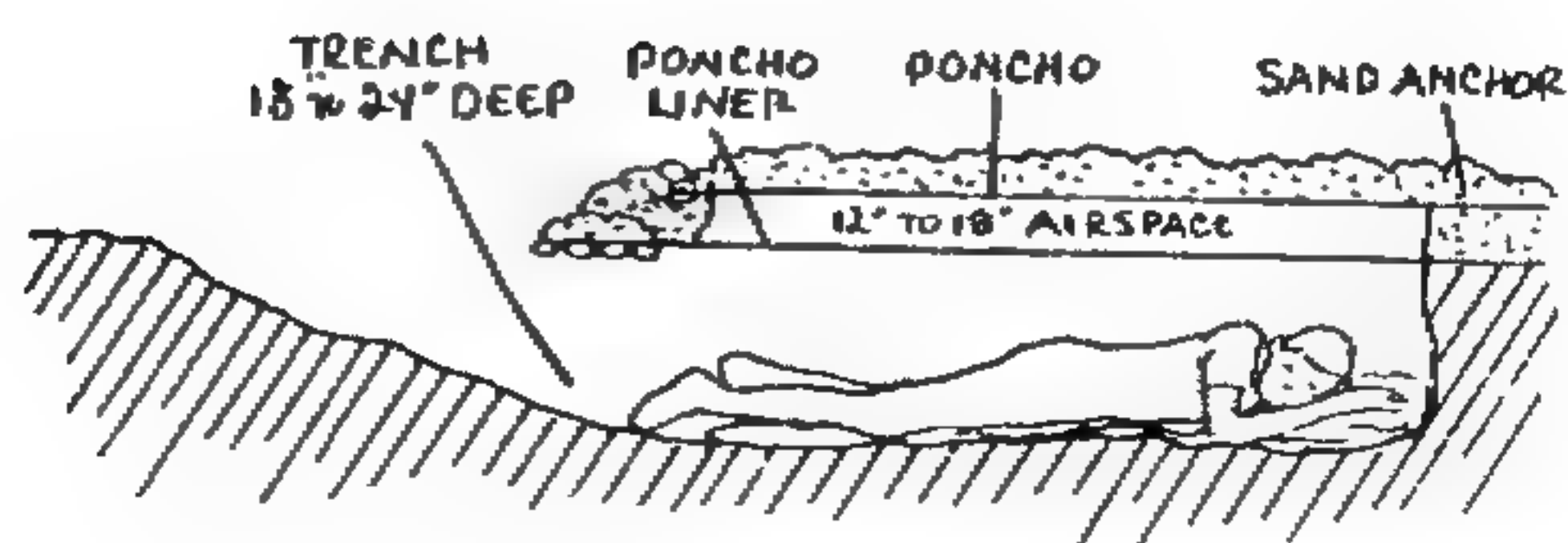
A swamp bed to protect you from wet ground



A tree pit snow shelter



A desert shelter



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First Aid

Getting enough water and food is important in staying healthy and helping the body fight off disease and heal injuries. Cleanliness is also very important in preventing infection and disease. The ability to wash clothes, and yourself daily can prevent many health problems. Sunbathing kills many bacteria on the skin. Washing in ashes or sand can be done in a pinch. Soap can be made by cooking fat to obtain grease and then mixing it with a strained mixture of fire ashes and water. By boiling the mix until it thickens and allowing it to cool you can make bars of soap.

Keeping your hands clean by washing regularly so you don't ingest germs, and keeping hair clean and trimmed to avoid lice and other parasites will help prevent disease. Wash clothes after each wearing or at least air them out in the sun daily if possible. Brush your teeth daily, or use a cloth on your finger to rub all tooth surfaces and use a string to floss.

Stay Rested

Know how to clear airway obstructions and give artificial respiration

Bleeding can be stopped by applying direct pressure with a hand, clothing, or bandages

Elevate the injured extremity

If the bleeding has not stopped, apply a tourniquet above the bleeding area and release every 15 minutes to restore some blood flow

A tourniquet can be improvised by wrapping a handkerchief or other cloth around the limb above the wound and tying it. Pass a stick through the knot and tie it. Then twist the stick so that it tightens around the limb.

If a person goes into shock, have them lie down on a level surface with the legs elevated

If the person is unconscious, lay them on their side so any vomit or blood can drain away from the mouth

Keep them warm with blankets or by adding outside heat if necessary

Outside heat can be improvised by wrapping hot rocks from a fire in clothing, using a prewarmed sleeping bag, hot water in a canteen, or fires on both sides of the injured

Insulate the person from the ground with clothing, or plant and tree material

Improvise a shelter to protect them from the weather

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Give them warm foods or liquids if they are awake

If insect bites are a problem, do not scratch the bites

Inspect your body daily for attached parasites and burn them off or cover them in

Vaseline, tree sap, or oil to cut off their oxygen and they will release their hold

If you are stung by a bee, immediately remove the stinger and venom sac

Itching from bites may be relieved partially by applying a mix of mud and ashes, dandelion sap, coconut meat or crushed garlic leaves

All bites should be thoroughly cleaned and if they come from poisonous insects, the venom should be sucked out

If a site becomes infected and turns black (necrosis), this tissue must be cut or scrubbed out to prevent the spread of gangrene.

If the infection appears to be spreading, flush the wound daily with water or fresh urine

Drink plenty of fluids

Treat with antibiotics and antiseptics if available

If supplies are not available and you have a necrotic infection-

Consider maggot therapy which involves exposing the wound to flies for one day and then covering it up.

Check daily for maggots

Once they develop, keep the wound covered and check daily until the dead tissue is cleaned out. Then remove all maggots before they start on the healthy tissue. Increased pain and bright red blood at the site indicates they hit healthy tissue

Flush the wound repeatedly with fresh water or urine to remove the maggots

Check every 4 hours to make sure the wound is clear of maggots and detritus

Bandage the wound and treat normally

Infections, rashes, and boils should be kept as clean and dry as possible

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Internal parasites such as worms can be fought by-

Ingesting 1-and 1/2 cigarettes and repeating 24-48 hours later. The Nicotine will kill most of them

Ingesting a mix of 4 tablespoons of salt with 1 quart of water (do not repeat)

Drinking 2 tablespoons of kerosene and repeat at 24-48 hours.

For diarrhea, improvised solutions can be made of-

Tea containing Tannic Acid made from boiling the inner bark of hardwood trees for several hours (it will have a bad taste)

Mixing a handful of ground chalk, charcoal, or dried bones and treated water till it is the consistency of kapectate

For burns; soak clean rags for 10 minutes in a boiling tannic acid solution (above) and cool and apply to the wound (Do not use grease or fat)

Broken bones need to be supported with splints tied to the limbs. Serious breaks in the neck and spinal cord require immobilization and great care in moving.

Group Survival

Survival among groups of people depends on leadership and know how. Leadership is the most critical because someone needs to know what to do and be able to teach, organize, and direct the activities needed to save everyone. If people become afraid in the face of common danger, their fear may result in panic rather than concentration on solving the problems.

The leader needs to produce strong group morale by encouraging and reinforcing small group achievements. You can never build morale by external pressure and threats. You must build it by making everybody part of a team that is producing little victories and that can meet failures with persistency rather than giving up.

Moods and attitudes, both good and bad can become contagious and infect everyone involved. Bad attitudes can destroy hope and cause destructive panic, while positive attitudes and constant reinforcement of positive events and achievements will spread confidence and hope.

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The important factors in group survival are

- Formulating goals to help each other survive and face the future
- Organizing the manpower so that people know what to do and when to do it
- Keeping everyone well briefed and encouraged
- Finding the right people with skills to best do each job
- Make use of everyone's suggestions and criticisms
- Taking action now rather than waiting and wondering about what is the best course
- Check all equipment
- Survey the situation so you know everything about it. That's how you beat fear of the unknown
- Have confidence in your ability to survive. Your knowledge and skills make the difference
- Learn peoples reaction speeds and habits. This avoids shock and panic when surprise strikes against you

On July 2, 1816, the French frigate La Meduse ran aground 62 miles from the African coast. The 6 lifeboats held 250 people and a huge raft was built to hold the remaining 150 and some food. The boats towed the raft for 2 leagues when the tow line breaks and the boats decide to abandon the rafters to their fate. The 146 people remaining on board have only 22 pounds of biscuits, several barrels of water and a few casks of wine. They have no sail, rope, anchor, or map.

Night number one- several men drown, carried away by the waves

Night number two- After drinking a cask of wine, the men mutiny against the few remaining officers in a fit of madness. Sixty six die from being held under water and drowning or being stabbed with swords.

Third day dawn- Only 67 survivors remain and all the food and water are gone
One of the men begins to dismember a corpse and the rest attack him like a pack of wolves. After only three days, the "fear" of starvation rather than any actual starvation has caused uncontrolled panic.

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Night number four- Hysteria causes 12 more deaths and the following morning, more passengers and crew kill each other. By now there are only 30 left, all of them wounded.

Day number six- After a short discussion, the dying are thrown to the sharks

Day 12- The remaining passengers are found and saved after 12 days of senseless slaughter.

Preparation, know how, skill, and leadership combine to prevent surprise and paralysis in dangerous situations. Developing team spirit and a command structure will allow a positive rather than a dangerous contagious spirit to develop. Do not let weak individuals who panic under stress and danger infect the rest of the group. The result is impaired judgment and people going along with senseless acts. Mobs are impulsive and very aggressive and generally don't solve any of the problems at hand. The individuals in a mob feel anonymous and believe they can be violent without accountability.

Good leaders (especially military ones) know how to use well learned and rehearsed instructions to channel work efforts. The group has to be able to meet aggression or danger as a single man. Everyone must be motivated by a common goal that the entire group wants to accomplish. This unit cohesiveness often takes several months to mold in military units with some members being too individualistic to make it. Installing the ideas of civic responsibility and group values takes cooperation and good leadership to achieve.

The leaders specific job is to provide honest, objective and calming information to the group he is leading. He must be able to delegate authority and responsibility to subordinates and must be able to keep his self control. It must also be understood that the ability to organize for survival, war, or other group activity is not the same as the ability to properly lead that activity.

The leader can also squelch panic by narrowing the alternatives down to zero. Most panic starts when people have a range of choices and everyone picks his own choice usually with his own preferences in mind. When German U-Boats were trapped in WW2 by allies trying to sink them, there were no cases of panic in the presence of great fear. This was due more to the fact that no one had a choice and they were all in it together no matter what happened. The only plan available was to sit out the attack and wait for the destroyers to leave. No other plan could work and everyone knew it.

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Firebuilding

Look for a dry spot that is protected from the wind (or build one)

Place it near or in your shelter

Find a supply of combustible material including parts of any plants, cardboard, cloth, animal shedding and so on. If the outside is wet, the inside is usually dry enough

Clear an area 3' from the fire in all directions

Build a firewall to act to direct or reflect the heat where you want it and protect the flame

Building an underground fireplace (in a hole) conceals the flame. It needs an air intake and is best near a tree to disperse smoke

To light a fire

Make a tinder bundle and lay it near the firewood

Light your candle or match and light the tinder holding it downward into the flame

A convex lens from binoculars, or a magnifying glass can be used with bright sunlight to ignite tinder

Scraping a knife against metal can produce sparks to ignite tinder

If a battery is available attach wires to both posts and touch the ends in the tinder to produce sparks

Striking steel on flint above the tinder

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6. Leadership

Leadership requires finding individuals with initiative, resourcefulness, imagination, and an ability to scientifically plan what they are going to do. There are usually only two ways of finding out who can effectively lead. The first is in actual combat. You can observe who successfully fights, wins and has the confidence and respect of their men, or you can setup a system to train, measure and judge men in simulated combat (training).

When the call comes for civilian leadership to step in, the war situation involves and swallows up entire nations. This is when choosing leaders must be improvised. Leaders can still be picked scientifically. Individuals who organize companies in civilian life will likely be good at the military equivalent in such areas as transportation, supply, communications, and most support functions. Finding out who can keep a clear head when the shooting starts and the picture is unclear, is more of a challenge.

Leaders have to be able to organize the work needed to be done to wage a war. They also have to be able to train people to fight this war. Finding and picking the effective teachers is a good place to start. Developing a superior ability to move and conceal men, use weapons, and react faster than an enemy, can be observed, measured, and judged. He must know the total business of fighting and killing and not be squeamish about it.

Modern electronics have turned the ordnance into thinking and remote control killing, which changes the leaders who needs to be at the front lines to inspire the troops. He must still be seen, but much of the modern fighting is done without even seeing the enemy eyeball to eyeball. This means that the better thinking "chess master" is likely to perform well.

Usually, if you find yourself improvising for war, you need to select leaders that know how to teach building improvised weapons and defenses and how to use them. Then you turn them loose with the support resources to do the job. Finding people from the smartest parts of the population to do this works best.

Leaders will be given and giving the jobs of-

Making the machines of war

Teaching how to use the machines of war

Learning how to improve on the use and designs of these weapons in the field

Passing on learned field knowledge to those in the rear to act on

Motivate men to get up and face the enemy while being shot at

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One final aspect of leadership involves dealing with civilians on both sides of the war. Refugees (your own) get in the way of your troops and create a burden to protect, feed evacuate, and move around. Enemy civilians who are organized by their governments to build weapons and provides men to kill you with are much easier to contend with.

In WW2 the allies did not hesitate to destroy the civilian populations of the axis forces. In modern times with television, most countries seem timid when the subject of targeting civilians comes up. In reality, even though much of the world has recently been revolted by the killing in Bosnia and Africa, those groups doing the killing generally achieved most of the objectives they set out to gain. In addition, the cry for justice over crimes against humanity were pretty much ignored by the participants.

The final lesson seems to be "keep on killing all the enemy until you win or draw" and this includes civilians who cannot really be separated from their own military units when they are the ones who provide support for their side of the war.

In the final chapter, I will examine some of the recent confrontations and apply ideas from this book to these situations.

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Chapter 12 Strategy, Tactics, Resistance and Countermeasures

This chapter will probably not contain anything that is not already known. Most of what I will cover here falls under the category of common sense. I am also going to use this chapter to play both sides of some "what if" scenarios that concern recent war situations and domestic attempts of "pretend" insurrection. The areas presented here are

1. Attacking philosophies and ideas
2. Defending strategies and tactics
3. Modern military concepts for the next century
4. What if examples
 - a. Kurds
 - b. Kuwait
 - c. Bosnia
 - d. Waco
5. U.S. Courts, Crime, Congress, and Change

1. Attacking philosophies and Ideas

If you take two perfectly matched forces with the same equipment, personnel, and leadership, meeting on open ground head on, you would naturally expect a drawn out evenly fought battle with casualties approaching 100% on both sides before the shooting stops.

Now take one of the forces, put them in rough terrain and let them dig in and stay put while the other side attacks without knowing their exact position. The results are very different. The attacking force will suffer 2-3 times the casualties of the defending force. Why is this?

When the actual actions of combat are analyzed, it is easy to understand why the defender is always better off.

1. The defender can plant machines to kill the enemy as they approach and pass over them. The attacker has to overcome or bypass these mines and traps while watching comrades die and suffer. They have to expend physical energy and emotion just to move through and deal with these conditions.

2. The defender can hide behind or under objects and cannot be seen. The attacker has to actually move physically toward the defensive positions exposing himself to gunfire while not being able to see where the fire is coming from. You can only reliably shoot what you can see.

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3. The defender can harden his defensive positions, making the only place he is exposed and vulnerable to comparable fire is the small hole where his gun sticks out. This means that the attackers bullets bounce off his shelter while his bullets cause injuries.

4. The defender can create obstacles causing a funneling effect on the attacker. By causing the attacker to be squeezed into a narrow area, they may only have to actually face a small amount of firepower at a time. The defender can concentrate superior firepower on the narrow funnel point, all of it concealed. In addition, by layering this firepower, the defending troops near the front are continually covered around their flanks and blind spots.

5. The attacker usually brings his men in inside of vehicles. A large vehicle is a lot easier to spot from a distance than a man on foot, and it is no contest between hidden men and a big lumbering hunk of metal. The hidden forces always get the first shots off, sometimes for many rounds, and if they are firing lethal ordnance, it is possible for the fight to be over with little or no return fire.

6. The defender knows the terrain because he got there first and had a chance to pick all the good spots and high ground to observe the attackers approach and get better shots off. He can also coordinate his own fire better because he sees what is going on. He knows where the attacker is coming from because he can see him and he knows where all his own forces are. The attacker is on the move and usually doesn't have as good of an idea where all his own forces are and cannot see any of the defenders if they prepared well, although they will see the bullets and shells coming in.

7. The defender can have his front lines withdraw in a prepared and organized fashion under cover if required. The attacker has to simply run for it.

8. The defenders casualties are not seen by the attacker because his wounded are concealed. The attackers men are usually in view when injured. This invigorates the defender and demoralizes the attacker whose men may panic and run. The attack easily breaks down.

9. The defender can draw the attacker into areas where he uses up his precious firepower, ammunition, fuel, and nerve with very few men and resources. By the time the next defensive layers are reached, the attacker may be running out of supplies, energy, and nerve while most of the defenders are at 100%.

10. In virtually all attacks, the attacker is functioning as a patrol that becomes ambushed

11. The defender can cover his mechanical soldiers (the mines and traps) with smoke to add to their concealment and terror effect.

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12. The defender can retreat to tunnels underground if he had time to build them. This allows him to add to the obstacles, funneling effects, slowing down and overall attrition of the attacker, not to mention the added fear of the unknown. The defender knows what is in there and knows his way around. The attacker feels he is crawling into deep manure.

Given the physical differences of exposure to fire, it would seem to be nearly impossible for the attacker to win battles and wars without incredible material, firepower, and, technology advantages. This has generally been true throughout the history of war. There are a number of strategies and tactics that an attacker can adapt and train and prepare for in advance that will allow him to win these battles. You have to be able to win these battles or you can't win the war.

What can the attacker do to overcome the defenders advantages.

1. Equip and train his men to use remote observation and fighting equipment to detonate or remove mines and traps, and attack the enemies positions without exposing his own men to direct fire. This can include grappling hooks, observation cranes, rooter snakes, etc.

2. Use smoke or fog to blind the enemy and cover most of your approach. This works especially good if the attacker can use polarized light to see through the smoke while the defender can't.

3. Provide personal armor and camouflage beyond the normal issue for the front line troops.

4. Concentrate massive amounts of all his firepower on small areas that can be chipped away at. You don't have to attack in a funnel. You can use your engineers and scouts to find places to attack on the flanks or weakly defended areas.

5. Move offensively into important positions such as hills overlooking the battle zone or encircle and cut off the defender forcing him to come out and attack you, enabling you to shoot from hidden positions. This is called moving offensively and fighting defensively. It works best if you can outmaneuver the enemy and reach a critical spot like a road or rail junction that they need. In this way, you can turn all the defenders advantages into your own.

6. Use the classic historical strategy of starving the defenders out if you have the time. This strategy was regularly used by the Serbs in Bosnia to good effect despite the supply efforts of the UN. The siege actually did not end until the U.S. entered the war with air power and a considerable threat of ground force (taking sides).

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7. Hit alternate targets such as neighboring cities, or appropriating livestock herds and rural resources forcing them to come out to interdict your efforts. Conducting scorched earth policies in the area may also do the job.

8. Use fire, or chemicals and biologicals on the defenders to eliminate hiding places and drastically increase the misery of holding the fixed positions.

9. Attack at places and times that combines a local superiority in numbers and the element of surprise. This may include night attacks or a paradrop behind lines.

10. Don't attack in muddy or bad weather. This only slows down the pace of attack.

11. Use all firepower to utterly destroy a key enemy strongpoint and bypass and cut off the other interior positions. These cut off groups may surrender without having to root them out.

Caution: Do not use men as cannon fodder. The Japanese Banzai charges looked great in the movies and were heroic. The end result was that they all ended up dead and the Marines still held their positions.

12 If the defender runs, pursue quickly to turn the withdrawal into a rout. This is best done if you can move parallel to the defender so you don't slam into an unexpected rear guard. If you can get ahead of him and set up your own ambush, it is better.

Many other things can be done such as better and more realistic training in the things that actually count on a battlefield. Knowing how to maneuver, how to fight in built up areas, knowing how to overcome obstacles and detonate traps without injury, and how to use all the equipment you have (or improvise) which will make a material difference on the battlefield.

Getting civilians to side with and support your efforts not only are good for morale, it helps to have extra factory production since overcoming an enemy in long wars often requires more of everything (usually 3 times as much) to win.

Knowing what to attack (priorities) can be as important as how, when, and where. Enemy military units are always a priority and are selected according to the threat and circumstances you find yourself in, as well as the resources available to you. You can't attack an enemy air base from a thousand miles away without aircraft, ballistic missiles, or behind the lines forces. You have to chose from what is possible and realistic. After the obvious military threats are dealt with, attacks often involve destroying the enemies will and ability to resist. These targets include

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Railway Systems: Cars and tracks, bridges, and curves to cause derailments.

Highway Systems: Bridges, demolition of adjacent hills and mountains, mining, etc.

Waterways: Ports, dams, canals, locks, bridges, levees, and ships.

Air Forces Systems: Airfields, parked aircraft, terminals, hangars, radar, radio, lighting, and defenses, as well as aircraft attempting to take off and land.

Communications: Telephone wires, buried cables, microwave towers, terminals and transmitters

Power Grid: Cutting power lines, substations, generating stations and equipment.

Water Supplies: Reservoirs, pipelines, purification plants, towers, and intakes.

Fuel Supplies: Fuel storage- under and on top of the ground, pipelines, depots, truck and rail tankers, and ships.

Industrial: Includes all equipment, supplies, transportation, power, and personnel.

Political: Leaders, gatherings, headquarters, transportation, communications, protection.

Clandestine attacks on individual targets usually require access to the premises they are located at. Ways of gaining access to a target with ordnance may include

Vehicles (drive thru)

Doors

Windows

Chimney

Drilled hole in a wall

Vents

Water Pipes

Sewer

Gas Lines

Electrical Lines

3rd Party- Mailmen, Delivery men, Visitors

Subterranean (tunnels)

Pets, animals, insects, etc.

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2. Defending Strategies and Tactics

After learning all the advantages of defending, it seems that there isn't a lot left to cover. Many of the tactics described for the attacker can also be applied to the defender, especially if he sees an opportunity to counterattack.

1. Defend in depth using as many nonhuman (traps) troops as possible. Organize direct fire on these traps so it becomes impossible for an attacker to deal with the trap unmolested.
2. Large urban areas can swallow entire armies to cover and attack. By falling back to layer after layer of built up defenses and obstacles, even the best attacks can be chewed up over time. (Stalingrad, Kursk, and Abadan come to mind)
3. Enemy armor, and vehicles are more easily destroyed by foot soldiers in cities and around obstacles because they can be more easily heard and seen and cannot use long range standoff fire in towns.
4. Enemy mobility is quickly arrested and resembles quick sand when mobile vehicles have to enter the close combat battles.
5. Street and house fighting requires training, practice, and organization. Especially withdrawing to new lines. Everyone must know in what order they move, who is to provide cover fire, and who fights the rear guard actions.
6. Civilians can add drastically to the defenders abilities by feeding, supplying, and encouraging the defenders.
7. A continuous front does not require a large concentration of troops to defend.
8. Defenders shoot from the safety of their holes.
9. The only way the attacker can actually win is to hunt down and kill everyone (very difficult without weapons of mass destruction) or get them to surrender. Keeping up morale and making sure everyone believes in what they are fighting for, can win in the end (see Chechnya)
10. Setup continuous ambushes and planned withdrawals to attrit the enemy.
11. Build and prepare obstacles, ditches, and traps everywhere and make sure you know your way around them. The attacker has to get out of their vehicles to enter buildings and tunnels. If these contain numerous traps, the survivors may not want to keep up the offensive.
12. Use tanks and armor to defend with, especially against a larger force which cannot easily damage entrenched and armored vehicles. Tanks are nearly immune to artillery.

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13. Improvise personal armor everywhere.

14. Withdraw from massed artillery fire causing the attacker to use up precious ammo blowing up rocks. Let the traps fight for you while your men rest up in their deeper positions

3. Modern Military Concepts for the Next Century

So far in this book I covered a number of ideas including the Rambo Rooter and Rickshaw, and the use of remote video and combat systems mounted on cranes. While these have obvious merit and will likely be used in the future, there are other potential concepts that may see future experience in war.

My short career in the US Navy was like living on a yo-yo with extreme ups and downs and the combination of good memories and common experiences mixed with some really rotten ones.

[During my "A" and advanced schools in sub hunting I would complete and hand in the two hour technical tests in 5-10 minutes with nearly perfect scores each time. This resulted in accusations of cheating and at least one time of being a spy. This was one of the common occasions of wanting to deck a superior officer. The Navy didn't teach pattern recognition of enemy sub signatures on Lofargrams which I recommended to them at the time in the school critiques. They required doing every observed line from rote memory. Aside from this I found the schools to be more effective than college.]

These aside I made several observations which I felt at the time would be likely and sensible future trends. Since no one else has publicly discussed these potential warmaking improvements, I will describe them here.

1. While stationed on board the USS Enterprise I came to the conclusion that the armed forces waste incredible amounts of money on duplication of fighting systems and on tearing apart their ships and upgrading every few years (as if this is something new). The solution I devised for this can be described as follows (I thought this up in 1976)

The entire service should be populated with a single mass produced ship design of about 200-300 multi purpose carriers. These carriers would each be about 50% wider and nearly twice as long as current aircraft carriers and resemble the oil supertankers in size and crew complement. These ships would have the following functions only-

- a. Carry the fighting systems, soldiers, planes, and supplies from here to there.
- b. All fighting systems such as missile batteries, planes, artillery/guns, and so on will be multi service, modular, and drive on, drive off, or fly on, fly off.

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- c. The extra length and deck area would allow planes to land and take off without a catapult and arresting gear. This saves considerable operating expense and maintenance. It also allows all the service combat (small sized) inventories to fly and fight from the ship.
- d. The crew should number not more than 50, with the fighting arms loaded on board supplying their own maintenance and service personnel.
- e. All electronic equipment for C&C (command and control), ECM, Radar, and so on would be drive on and drive off and modular in nature. This saves having to regularly tear the ship apart to replace the obsolete hardware. Cranes can be used to replace the current tower systems.
- f. The vast size of the ship would allow the outer compartments to actually be filled with a chemical foam that is lighter than water and provides buoyancy should an enemy attempt to make Swiss cheese out of the vessel. This ship could be designed with enough such material to make it unsinkable no matter how many holes were put into it. Even if blown to pieces, all the parts would still float. This would greatly enhance crew confidence and be a discouraging condition for an enemy to face. The chemical foam would also contain a water activated foaming agent similar to the ones I have patented which would be combined with a plasticizer that would fill the holes as they were made. This would allow the ship to heal itself and fill in the damage as it occurred and make damage control easier. Having an unsinkable ship is an advantage in war.
[This will probably work to seal small sized holes or cracks. Huge, gaping holes are always hard to fix and might not be sealable until the inflow water velocity subsides.]
- g. The ship would have a series of portable telescoping decks with leg extensions that would allow a ship to load and unload by drive on and drive off from up to several thousand feet from shore.
This allows fast unloading and loading and is effective against defended shores. The deck and leg assembly would also allow the unloading over and bypassing of beach obstacles and mines.

Given the concepts of directly using all the fighting capabilities of the combined Navy, Army, Marine and Air Force plus the idea of mass producing a single design would greatly lower the ship building cost of the country, lower maintenance through the use of modular systems, and with a fleet of a couple hundred multi purpose carriers, the US could project 10 times the sea based air and ground power that it currently can (at considerably less expense). The use of crew sizes of 1/100th that currently used would result in great cost savings for the country.

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2. The modern missile designs could be standardized with combined high tech video, thermal, and radar targeting systems and smart warheads that could fuse the explosive in different locations for anti-armor, anti-air, or anti-personnel purposes. These missiles would be used by all services, and could have smart targeting chips that would let you select target type (air, sea, land armor, land infantry, or land bunker). In addition, an Icon of the target type could be presented on a screen asking where you want the target hit, such as on the top of the tank on the turret, or its track, or at a 90 degree angle on its rear armor. These options could be selected by anyone such as a sailor on the deck of a ship firing at incoming aircraft or enemy patrol boat, an infantryman assaulting a building or entrenched position, or a man in the back of a helicopter trying to protect his craft from the enemy gun positions.

The use of a standardized explosive, propellant and targeting package with modern computers which can easily be upgraded would be of great benefit to the services. By using mass production assembly methods and training by all service personnel, the cost of the missiles could be as low as couple thousand dollars. By buying a million missiles a year and using most of them in practice each year, you could keep everyone well trained, while maintaining the factories and inventory turnover that is necessary for effective field weapons and wartime readiness. It would also reduce the costs to the country. By using the electronics to provide the smarts, you can get by with 2 or 3 missile designs rather than the several dozen used by the services now.

My only close up experience dealing with shipboard missiles came when the Enterprise would test its onboard antiaircraft missile system. We would all go into hiding to the inner compartments on board ship in the hope that if the missile hit the ship or exploded without taking off, we would actually survive the test (this was back when you loaded a computer program by flipping a series of 16 or 32 switches and pressing a load button several times). By contrast, we knew that the Tomcats on boards could shoot down almost anything.

The services need one system that works all the time and can be used by anyone, and they need a lot of them for war purposes without bankrupting the country.

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4. What If Examples

I decided to apply the ideas I have discussed in this book to several real world examples that we read about in the news. Armchair generals abound, but actually having a plan in which people can be shown what to do is always better than no plan, or having no one in a position of knowing what to do.

Kurds

When the US decided not to go to Baghdad and leave Saddam Hussein in power, it decided to encourage a revolt among the minority populations without actually providing aid or guidance. The US seems to have a need to self inflict failure on its own ideas by not providing the resources necessary to have a snowballs chance in heck of actually succeeding. This seemed to start in a modern sense with the Bay of Pigs and has been regularly repeated since then. The US decided after watching Saddam use force and starvation to exterminate the Kurds, that they would lead an international effort to protect and feed the Kurds. This lasted about 5 years. The CIA evidently provided about \$100 million in aid to support the efforts to be independent. When Saddam was invited to march back in, he overran the Kurd positions in a few days. President Clinton responded by launching 40 some cruise missiles to send a message and then declared a policy victory. Five years earlier, the allies bombed an missiled Saddam by the thousands on a daily basis and couldn't get him to withdraw from Kuwait. To even pretend that a few dozen missiles could actually cause more than an annoyance to him seems absurd. The point of my discussion here will be, what did the CIA spend \$100 million on to help the Kurds defend themselves against Saddam.

Was the money handed out as welfare, or could it have been put to use building defensive obstacles and positioned weapons and defenses (and training and paying the workers). Did the CIA actually want to train them on how to make the necessary explosives and armaments from the local materials, or did they choose to keep them defenseless and dependent so as not to upset Turkey should any of the Kurds use the know how or supplies for insurrection there. My position is that there is much that could have been done to physically separate the Kurds from the Republican Guards rolling Tanks and APC's with the idea of using A-10 strikes to stop a slowed down assault in the future. The \$100 million could have been used to teach essential resistance skills and build the basic armament industries. Precast and premade obstacles could have been constructed and delivered to northern Iraq to at least blockade the main roads. Given the job, here is what I would have done.

The money would have been used to establish a defensive perimeter, army, and munitions factories. If the Iranians could stop Saddam with entrenched positions there is no reason the Kurds couldn't duplicate the trenchworks and build comparable obstacles.

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Army training would include

- Drilling
- Hand to hand combat and weapons
- Basic Firearms
- Use and manufacture of Mines and Booby Traps
- Survival, Evasion, and Camouflage
- Fighting in built up areas

Basic Munitions would have to center around the extraction of Niter from the soil and the manufacture of munitions from available mined material. The funds would be used to finance the operation of the mines and factories. Once the final explosives were made they would be used to build large numbers of mines and as ammunition for portable weapons. Large numbers of Kurds could be employed, and paid to build layers of ditches and obstacles. This would keep them busy doing something productive and the fact that they are paid for work, would help establish at least a minimal market economy in the area. They would also learn the basic survival and fighting skills needed to protect themselves.

Machine tools and steel would have to be purchased to build the large numbers of arms and ordnance that would be necessary to offer any resistance.

Although it would be a heavily criticized decision, I would also have provided the know how for chemicals and biologicals with the obvious ability to poison the rivers and water supplies of Iraq. The mere threat of giving Saddam a taste of his own medicine would not only be ironic, it would be poetic justice if it were actually used. The threat of retaliation in kind prevented Hitler from using nerve gas during WW2. Since Saddam seems cut from the same mold, the threat, or its actual use would have a strong inhibiting effect on his ambitions.

To help the Kurds be self sufficient in a positive way, the US should probably have supported a few basic mining and farming industries which would have produced a multiplier effect on the local economies and turned the hopelessness and welfare conditions into a self supporting system.

Kuwait

At the other end of the same country is another target of Saddams ambitions. Having looted the country once, it is likely that Saddam will eventually do it again. He has little to lose since he is being choked by UN sanctions anyway and has learned to live with it. Given time and repeatedly "working" the persistence of the US, he will likely wear down the will to jump in with every threatening move he makes and he will probably try to retake Kuwait again.

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The Kuwaitis have the benefit of their oil wealth, US weapons, training and support, and most importantly, the time to prepare. Given the huge nature of the threat and the reality that they lose by default if the US doesn't fight, it would be expected that they would make considerable preparations for the defense of their country.

The basic strategy should be a series of huge anti-tank ditches in depth (50 or so layers) surrounding the entire country including the Saudi border so that Saddam could not attempt a flanking maneuver. The space between the ditches could be filled with a couple hundred million mines (from the Iraqi inventories would have been nice). The strategy here is obvious, they (Kuwait) have a lot of money and little manpower. The money needs to be converted to as many mechanical and electronic soldiers as possible while they are able. This would leave the air and sea routes as the only quick ways in. Since the Iraqi's don't have any Navy to speak of and most of their air force has been whittled down to Kuwait's size and skill, these do not pose the same threat as they did in 1991.

The highways would then represent the only direct unimpeded traffic means of entry. This could be dealt with by placing pipes under the roads matching the 50 deep ditches dug by earth moving equipment. When an attack is made, the pipes are filled with explosive, detonated, and the roads turn into a massive series of speed bumps. All this is to no avail if there is no army or air force to meet the spearheads. The Iraqi's would simply fill in the ditches, plow the mines and move on. The difference here is that if, while all their equipment is backed up and standing still while filling in the ditches, US or Kuwaiti A-10s and tactical fighter bombers can do a repeat of the highway of death and Saddam could lose his entire force. A stalled armor attack would be in a deadly position in the open desert if it can't move and maneuver.

One other strategy would be to emulate Israel. They have been surrounded by far more numerous enemies and have survived because they could mobilize and enlist the aid of most of their adult population. In this spirit, arming every household with anti-armor recoilless launchers, positioned weapons, and guns would give the population a fighting chance and would seriously bloody any attack that reached Kuwait City (provided the population doesn't want to take over).

If possible, this defense needs to be combined with smart artillery (anti-armor shells) and tank busting aircraft and helicopters. It might even be possible for the Kuwaitis to do so much damage that the attack would fail and western intervention wouldn't be needed. With the amount of money they have to buy the weapons, obstacles, armor, and mines they could practically defend their borders by remote control. Without a large scale ability to fly over or go around the obstacles, the Iraqi army would have to do it the hard way, and they couldn't do it against fewer layers of defense in Iran. Defenses in depth turned back German blitzkriegs at Kursk, Moscow, and Leningrad and have seen success in many wars where maneuver and easy egress are stopped cold. If these types of preparations are not made, both Kuwait and the US may be in for an embarrassing "I told you so".

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Bosnia

What a mess. When the UN granted Yugoslavia an arms embargo on its former republics in September 1991, it granted a virtual license for the use of its locked in armed superiority to reestablish control over the region. Had there been a sense of any decency and justice when the army and the Serbs armed forces were used, they could have ended any prospect of world outrage and intervention. In the event, news reports acted as a catalyst for domestic and foreign outrage and things got out of hand quickly (is this an understatement?). The Yugoslav and ultimate Serb strategy ended up being a series of encirclements, followed by softening of the surrounded target cities with artillery and starvation. The Moslem and Croat strategy (when they were not fighting each other) seemed to be one of putting out any fire they might be able to reach with their forces and let things run their course elsewhere.

The Bosnia Muslims bore the brunt of ethnic cleansing and had at least some moral support due to the efforts of their enemies to exterminate them. As I have already stated, any population has a right to use any means of survival when the enemy comes to their door to kill them. When surrender only brings death, you don't just surrender. Despite the terrible conditions they faced and the Arms embargo, a ruthless enemy, and lack of organization, there are a number of things that could have been done.

First, after the massacres of captured populations occurred, there was probably a justification for manufacture and use of chemical and biological weapons if for no other reason than to force intervention. For each city "cleansed", a policy of depopulating a Serb city could have followed using nerve gas or Botulinum toxin. This might have also made it easier to bring the overconfident Serbs to the bargaining table in good faith. In the event, the use of chlorine gas was threatened by the Bosnians when they were in danger of being overrun.

Barring a decision to manufacture weapons of mass destruction, the only choice remaining was a mostly defensive battle of attrition (lacking proper arms for an attack). This is what generally occurred until the embargo was bypassed. Several actions could be initiated to cope despite the embargo, and this is where know-how comes in. You can teach the population how to build its own armaments, feed and house itself in the forested areas, and build its own armament industries. Specifically-

1. Building a rocket factory with similar characteristics to the Soviet Kaytushas of WW2. These would have some effect as counterbattery artillery and would provide considerable encouragement to the soldiers and civilian populations they are built to defend.

2. Building at least a few video guided missiles that could reach important targets behind Serb lines. This effect would be more psychological, but anything encouraging would help.

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3. Teaching the entire population the basics of improvised warfare and survival would have added to the numbers needed to resist Serb aggression and eventually relieve besieged cities. Most cities could survive starvation when surrounded by forests (even without UN supplies) as long as the population has free access to go and collect what they need. When the Serbs surrounded the cities and exterminated those coming and going, it forced the Bosnian Muslims into attacking their now entrenched defensive positions (moving offensively, fighting defensively). Use of nerve gas would have been particularly effective in attacking selected positions, especially if delivered by rocket. If this is not a realistic choice then infantry assaults up the hills becomes the main option.

4. Attacking Serb positions requires infantry assaults on surrounding areas to effectively cut off the artillery and starve them out. (moving offensively, and fighting defensively in reverse). Some of this was done near the end of the war. Large local concentrations to give manpower advantages and especially supported with anti armor munitions would be needed. Mining every approach was also practiced. These types of infantry maneuvers and actions requires intense and specialized training which was apparently provided by retired US military consultants and used to good effect.

5. Attacking Serb cities to draw off troops would also have been effective.

6. Collecting or importing personal armor materials that were not subject to embargo

Survival and improvised warfare training for the general population could have gone a long way to evening up the odds and preventing the easy massacres committed by the Serbs.

Waco

As in all situations, there are two sides to the siege that ended in a massacre at Waco Texas. I do not intend to take a strict position on either side other than to say that David Koresh effectively enslaved a small group of people by using sleep deprivation, dependency, and other subtle and regimented methods to control his flock and make his own life better and didn't really care about improving the life of his followers. He hid behind a mask of religious rights and privilege permitted in this country, (although freedom of religion isn't really free any longer when people aren't allowed to think for themselves or change their minds). My sympathies lie with the innocent followers and children who had to die during the battle fought between Koresh and the government. Neither side was prepared properly for their fight, and neither side had thought through their real goals and plans and how to achieve them. I will offer a devil's advocate view of things that might have been done to change the ultimate outcome without making further comment on the moral issues involved.

1. The defense of the compound: Given David Koresh's state of mind and a clear intent to fight to the death, it seems hard to imagine that any rational plan for the long term defense and eventual survival of the compound and its inhabitants could have ever been implemented.

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Statements of intending to wage war with the US Government were so preposterous that they only left observers with the impression that the cult leader was demented. If he really did believe and intended to wage war with the government based on the few hundred weapons in his armory and no plan, then he probably was demented. In reality, he was probably too busy with his own control priorities to actually prepare for any assault. The complete lack of a scientifically prepared defense bears this out. Even though he achieved early tactical surprise due to informants, he was clearly strategically surprised and unprepared for a siege. Given the circumstances they were living under, the following actions were called for to improve the ability of the cult to defend itself and improve its position to negotiate a favorable end settlement.

a. A plan needed to be devised to produce such great obstacles to any law enforcement attempt at takeover, that a negotiated settlement would be the only possible outcome. The use of superior firepower from the guns used by the Davidians was only temporary. No matter how big their guns are, US law enforcement are always going to be able to bring more and bigger ones. This was obvious. It is also obvious that the use of artillery, bombs, air strikes, and armored assaults used against American civilians are generally not considered acceptable (see Philadelphia in the early 1980's.) Given this as the only restraint on the governments possible use of force, it should have been possible to construct defenses that were beyond the practical ability of any US law enforcement agency to overcome without military intervention. This would have allowed the Davidians to negotiate a more favorable legal conclusion to the standoff from a position of clear defensive strength. If anyone was to ultimately survive the episode and go on with life, this was the only reasonable plan that could have been pursued.

2. Given a plan to properly defend the compound against a non military assault, the Davidians started with an already impressive arsenal in place including several hundred guns, grenades, and some explosives. Many of the cult members had been well trained in the use of these weapons.

3. The near absence of any defensive personal armor in the form of flak jackets or movable armor (the Rickshaw described earlier) showed up in the casualty count from the first gun battle. An investment in these types of armor would have reduced casualties drastically.

4. The firing positions were not prepared with small observation ports to fire from (resulting in a lot of shooting blindly through walls). In addition, the firing positions needed to be steel reinforced with concrete and soil covering to deflect all incoming munitions.

5. There was no underground facility or bunker to send the kids to when the shooting started. An underground bunker with reinforced concrete covered by a foot of dirt and in the main building would have been sufficient for a command post, shelter, and could have been wired for communications and exterior video surveillance. This would have allowed the proper dispatch of defenders to the key positions as needed.

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6. A positive flow, filtered air system needed to be installed in the bunker and key defensive positions to prevent the effective use of gas by the attackers. This would have enabled the defenders to remove their gas masks to eat, talk, and perform other essential activities without suffering the effects of the CS.

7. There were no anti vehicle obstacles anywhere. The government drove up and banged on the front door. Any real defensive efforts should have allowed the control of all approaches with an ability to shut them off when the shooting started. How much would it have cost to rent a backhoe for a month and dig 2 or 3 rows of anti whatever ditches. These ditches could have been filled with water with a pipe feed for chemicals in the event of assault. A modern equivalent of a retractable or drawn up bridge would have allowed limited and controlled access to the compound. The dirt could be used for inside fortifications or spread in an uphill fashion towards the buildings. Alternatively, it could be simply piled up in front of the walls allowing some protection against projectiles.

8. The area between the ditches could easily be mined, and barbed wire or steel imbedded in concrete could have posed an intimidating obstacle.

9. Tank reservoirs of several chemicals could be contained and hidden in the buildings. When an assault was attempted over or through the ditches, the chemicals could be discharged by opening valves into the ditches. These could include acid to cause burns on contact with the water. They could include fuel or incendiaries that would float and could be ignited during battle. In addition, combination chemicals that release gas when combined could also be released.

All of these ideas are based on the premise that the army is not used. I know of no law enforcement agency with bridging equipment or trained and equipped engineers. If the President ordered the army in, the battle would be over quickly since the army has personnel and equipment to deal with any obstacle and situation that could be improvised. Conversely, the law enforcement agencies would have strong self interest to conclude the affair without a battle. This would allow a negotiated and potentially favorable conclusion (given the circumstances). An assault against these fortifications combined with the firepower would prove difficult and require large manpower, medical resources, bridging and chemical protection equipment, anti-trap and mine countermeasures, all while advancing under heavy and deadly fire. No matter how embarrassing or pressured they might feel, anyone looking at the reality of breaching that level of defense would look hard at any reasonable alternatives.

2. The government assault of the compound: The same obvious problem of lack of personal protection, even inside of vehicles would result in an embarrassing repulse of the ATF on day one. The first and most obvious question here that needed answers is how to protect the men when faced with any kind of gun battle. The answer is to supplement the flak jackets, with the mobile armor on a dolly that you can see and shoot through. It would have been helpful to have armored plate mounted in the vehicles or on the back of a pickup bed to protect the agents from fire and shrapnel (there was no place to hide). A variety of rolling armored siege engines on wheels could have and should have been in their inventory and used in these types of situations.

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Armored crane lifts should have been used in the second story assaults rather than ladders. My personal opinion is that the officers that are called on to conduct raids against heavily armed fortifications carrying only clothes, flak jackets, guns, and skin are brave, disciplined, and in some ways completely nuts. Better personal armor that can be carried or rolled into these situations is an absolute must.

The use of remote video surveillance equipment such as that mounted on the ends of cranes, sewer rod, or remote mini truck or tractors would have been helpful in obtaining close up intelligence without risking life and limb. Some effort at gaining remote video nearby or in the compound should have been an early priority.

The use of anesthesia in any assault of this magnitude should have been considered. It is a lot easier to assault a position when most of the defenders are groggy, asleep, or perhaps having a lethal reaction to the gas. This has got to be better than simply choosing bullets and bravery. It could have been delivered by hollow sewer rod, overhead crane, helicopter, grenades, or mortars. The use of armoured vehicles with a narrow pointed battering ram containing video equipment (as opposed to CS gas) could have been sent in on a trial basis to collect interior intelligence, and plant monitoring or time delay equipment to support a later assault. The limited nature of this intrusion would likely have not precipitated the mass suicide/murder by fire that eventually took place. It would have also left the defenders feeling somewhat powerless at the armoured intrusion. The sheer intimidation of this approach could encourage a negotiated capitulation. This device could also carry anesthesia, stun grenades, taser wiring that could be fired in a web to mass stun all the room occupants, and so forth.

The final assault that resulted in fire being used as a weapon against both parties could not have been easily foreseen. The failure to withdraw by the armored vehicles after the application of the gas probably left the Davidians with a feeling of going down fighting rather than be taken alive. The use of nuisance music and other noise to harass and deprive rest probably worked against the ATF. Most people do not think rationally when tired. If the goal is to cause exhaustion to support an assault, then it probably makes sense. If all it does is add to the anger and intensity of the committed defenders, then it is probably not a good choice.

In retrospect, the only thing that can be done now is to have equipment and procedures in place to deal with it. The only ideas I have to offer regarding the use of fire in defense are based on the sciences of firefighting. To have a fire, you need oxygen, fuel, and ignition. Firefighters generally use water to cool ignition temperatures and fire retard combustibles. The use of chemicals to smother a fire are also used. Obviously a fire department presence may become necessary at future siege assaults. I wondered if an inert gas such as neon could be pumped into the buildings to smother the flames while limiting potential losses from fire and the lack of oxygen.

One final idea that I developed for firefighting involved the building of a huge fireproof blanket (100'x100x) made up of weaved carbon, boron and other fibers that could be placed over a building (or in the path of an approaching forest fire) to cut off the oxygen supply. It would also effectively blind the interior occupants of the building reducing the dangers during approach. The blanket could be delivered by helicopter, cranes (the ones used for college football night lights), vehicles, or held up on the ends of poles by the assault force. The effect would be comparable to smoke and would protect the ATF agents from a directly observed approach.

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5. US Courts, Crime, Congress and Change

It has taken me about 4 months to write this book. During this time I have been given flak from friends and relatives about the lack of merit in writing on this subject. My comeback has usually been that I am doing something positive. I did not give up and go on welfare when the bad breaks got me down. I didn't go out and try to sell securities to finance any new ideas that I may have had. I didn't just gripe about the bad breaks I had in my life. I sat down and did something about it. I wrote a book (and it is possible to write many, much more advanced books on this subject) that will help pay my own way in life. Although the subject is popular among a narrow audience, the niche is there and I have filled it.

Writing about scientific know how is still legal in this country and probably will be as long as we have the first amendment. There is no one that I know of who believes he can decide for the people of the country, what they will be or not be allowed to know. Still, while writing this book, there was a moment that I nearly shelved it to pursue more positive avenues. The same day I considered this, I received a notice from the bankruptcy trustee. I had been in bankruptcy court for 4 years and it was finally coming to a close.

The trustee ruled that because I had an option to buy stock at some future time in the chemical company I worked for, that he would retain a right to go after it in the future if it ever became worth anything. From that moment on I lost any regrets about publishing that I may have had before. Yet, I didn't want to finish the book without offering something positive and some hope or ideas that things can be made better. I have decided to describe my thoughts and ideas for improving "the system" that drives some people to taking extreme measures and here they are-

The Courts

After spending 6 years in 4 different courts over the same subject, I have come to the conclusion that the civil court system has very little to do with justice. The practical effect of a civil suit is that you are guilty until you appear in court to prove yourself innocent of the claims (charges) filed against you. This would be fine except that the boxes they build to fit you into the law has very little to do with innocence, guilt, or responsibility. Because our attorney failed to file a single page of a security filing in Kansas, all the officers and directors were automatically guilty of securities violations. None of them had ever done anything wrong. Many were old men. All risked having their financial lives ruined because of an honest mistake. The suing parties stopped the legal sale of the plant we built and then started competing companies and committed over a hundred acts of financial arson to destroy their own investment and strengthen their lawsuit. Our own attorneys told us that all this did not matter. Financial arson is legal. The only thing that mattered was the failure to file a registration paper in one state and we automatically lose. It is obvious that this case had nothing to do with justice. It only mattered what little legal box you fell into. Well, even this is OK. I could start over again. The problem was that the chase continued with the ability to sue being used as a weapon of revenge and power, to harass and intimidate. Not to see justice done.

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The solutions are obvious and easily implemented. The civil courts still need to be available to deal with real and honest acts of harm. Some wrongs can be righted (certainly not every one, especially imaginary ones). When somebody makes an accusation, especially a false accusation, there should be a responsibility built in for it. That responsibility would be that if, you are the one filing a claim, you, and your legal counsel will be personally and completely responsible you fail to prove the claims you make. This is not a loser pays. It is a rule that the filer pays if they lose or lie.

In addition, the securities laws and laws in general should be amended to make financial arson a crime. If you commit numerous acts directly or by proxy to harm your own investments, and then sue an insurance company (which they also did unsuccessfully) or others, you should be held responsible both civil and criminally.

The courts were intended to be able to allow people to settle their differences using neutral judges. People would go to court to resolve conflict rather than using fighting and gunplay. Unless this system is changed, I suspect many people will continue to resort to physical methods of dealing with injustice, I have certainly thought about it. This book teaches the skills necessary to do that, in some cases, invisibly

Crime

The bottom line of living in a modern supposedly civilized society, is that you have a known set of rules that everyone agrees to live by. Some of these rules don't work well for some people but everyone compromises so that we can all live together without reverting to "he who has the biggest guns gets his way". Unfortunately, many people will not live within the rules, and this is always going to be the case. Society tries its best to correctly identify, punish, or rehabilitate those it catches breaking the law. The system is imperfect, expensive, and in some cases unjust as well. There are a couple of ways to improve it.

1. Society has already begun to equip its officers with radio monitors so that their conversations and situations can be recorded. They are also using video equipment to record events within the visual sight of the vehicle. This is perhaps the best idea yet to assist law enforcement. The judges and the entire world can see and hear what happened and judge for themselves. When the rare occasion occurs when the officers do something wrong or worse, this too is available for scrutiny. It is hard for either side to lie when what they said and did is recorded. Taking this a step further, I have two ideas to drastically enhance this practice.

a. Law enforcement generally is unable to buy and obtain the best equipment at the lowest prices because of a lack of a centralized procurement and production plan. The federal government is the only entity capable of organizing something of this magnitude. If federal funding were organized to build a single design, mass produced, video-audio surveillance system for all law enforcement nationwide, a low cost integrated system could be built that would allow for remote audio when officers enter buildings (partial video may also be possible) and video in the car.

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In dangerous situations, the video could be transmitted back to the station to provide instant intelligence. The cost of such a system when mass produced by the hundreds of thousands could drop to the cost of standardized video systems on the shelf today (Complete under \$1,000 each). The benefits in knowing what happened for sure are considerable.

b. Law enforcement officers cannot be everywhere that a crime is committed. This causes considerable cost to society and leaves doubt during investigation and prosecution. Mistakes do happen. They may not occur often but they do, and it should be the utmost priority to at least have some assurance that you probably are right. For a crime to occur, someone has to be there to commit it. The physical act of being there means you are not somewhere else (an alibi). There is an obvious and easy (and using mass production as above) an inexpensive way of determining with a great degree of physical accuracy, who is at a crime scene and who couldn't be.

A series of high resolution cameras can be installed on utility or other poles every 10 blocks or so on a diagonal pattern 1 block apart (on the diagonal). The cameras would take a high resolution photograph in every direction every 10 seconds or so, day and night. The information could be stored digitally. The equivalent of a meter maid would pick up the photos and deliver them to a central storage daily. Only when a crime occurs, a judge would release the photo library which would allow the people in the crime scene area to be tracked both to and from the scene. Suspects could have alibi's easily checked. This would allow the police to have a much greater likelihood of being right. It would not be in their direct control, which means that if they are involved they can be caught. Evidence used in court is much stronger. Best of all, privacy can still be protected by limiting access to only criminal circumstances. This is already done on a small scale with the video photos used during red light traffic, and in many stores with video interior surveillance.

Putting a video police officer on watch every 10 blocks, 24 hours a day with a photographic (reproducible) and accurate memory would allow watching the criminals leave home, arrive at the crime scene, travel, and return home with a high degree of accuracy. After a while, with a system in place that allows for the quick solving of 99% of the crimes, bad elements in society would begin to curtail criminal behavior or be rapidly incarcerated for it. This will not solve all the problems, but it would get most of them. In the long run, it may actually be cheaper than hiring, training, and equipping more officers. It would also solve such things as car thefts, kidnappings, and perhaps even the O.J. Simpson "mystery".

The alternative is too ask ourselves how much money we want to spend protecting ourselves from each other.

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Congress and Change

Society needs rules that work for everyone. Most rules do work all right. It would be really nice if those in government would obey their societies rules as well. I have had a number of situations in dealing with government official in recent years in which the rules they are supposed to follow were ignored. These situations affected my life and I will briefly describe a couple of them here.

A few years ago, my company was selling a herbicide when we received a letter from US EPA that effectively put us out of business. The year before, we had submitted toxicology data to support a label change from danger to warning proving our product to be safer than alternatives. Congress had passed a law requiring reviews of submitted data in 90 days. The EPA has never come close to this. To make a long story short, after I wrote a letter for our President, news media and others (I sent it to the EPA first). They expedited the review, changed our label, and effectively "Made it right". This was a rare occurrence and required a PR gun to work. We also threatened a legal gun. Some in America use real guns in dealing with serious situations where government doesn't follow the law and causes them harm.

A State of Nebraska feed official who had a previous disagreement with me decided to not issue a feed license to my employer because I was the company president. This was an automatic license for \$10? that is issued on application to everyone. This was his way to exercise his "power" over me. He didn't have this power under the law and we had to threaten to sue the state over it.

Examples like these were a strong motive to writing this book. Abuse of power by government officials is a very real problem. Laws already in place, passed by congress are supposed to correct these abuses. I guess congress could pass a law requiring officials to obey the laws they already passed, but it seems pointless. Unless there is a real penalty involved, our officials don't seem to care.

When those in government lie and don't obey the law (and the US Supreme Court didn't help when they said it is OK for law enforcement to lie to help get confessions and information) they set a bad example for everyone. How can you expect the citizens of the country to try to live honestly when the law of the land is that it is legal to lie. Institutionalizing lies and ignoring or breaking the law by those in government responsible for it, is the real cancer eating away at the country. When the government doesn't have to tell the truth, why should we. When the government won't obey its own laws, why should we?!

Finally, the US Patent office should be encouraged to practice a little intellectual honesty. I can't sit here and say that they deliberately screwed me over. They are paid to screw everyone out of their rightful patent protection if they don't have the financial and personal stamina to pursue it for years at great expense. No amount of PR can gloss this over. If the Patent office continues to practice intellectual dishonesty to simply weed out applicants, this entire country will lose out in more ways than it will ever know.

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Inventors deserve the rights to own their honestly created inventions. If that and the application fee is not enough, then the office is dishonest and society will have to live with the consequences. (How much will the Governments have to spend protecting themselves from their own citizens?)

Despite being screwed over several times in my life I learned to live with it. I started over in 1981, building a large and successful feed business. In 1989, I started over again in my garage and in 5 years, my herbicide made it onto thousands of store shelves. Today, after all this, I am starting over again. This book was not my only option, but it was the only reasonable option under the circumstances.

My answer wasn't to go out and blow up a building (although I wrote a book about the science of that). I didn't act to cause personal harm to any government or private individual with the exception of writing letters I felt were appropriate.

Over the years, I could have picked a different attorney to file the securities

I could have used another lab for testing

I could have used other ways to finance my ideas instead of securities

I could have turned down many different paths and avoided all these problems.

I do not intend to live my life in a vacuum. I intend to pull myself back up out of the mud and forge ahead. I don't have to hurt anyone to right the wrongs I see (although it is obvious from the content of this book that I or anyone else could deal with such wrongs). The bad laws will eventually be changed and the world will go on. It may not always be safer, but it will go on. If our leaders show at least some effort to right the wrongs, there will be fewer books like this in the world. If they don't then there may be many new advanced books, as our disaffected and weeded out citizens look for other answers.

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